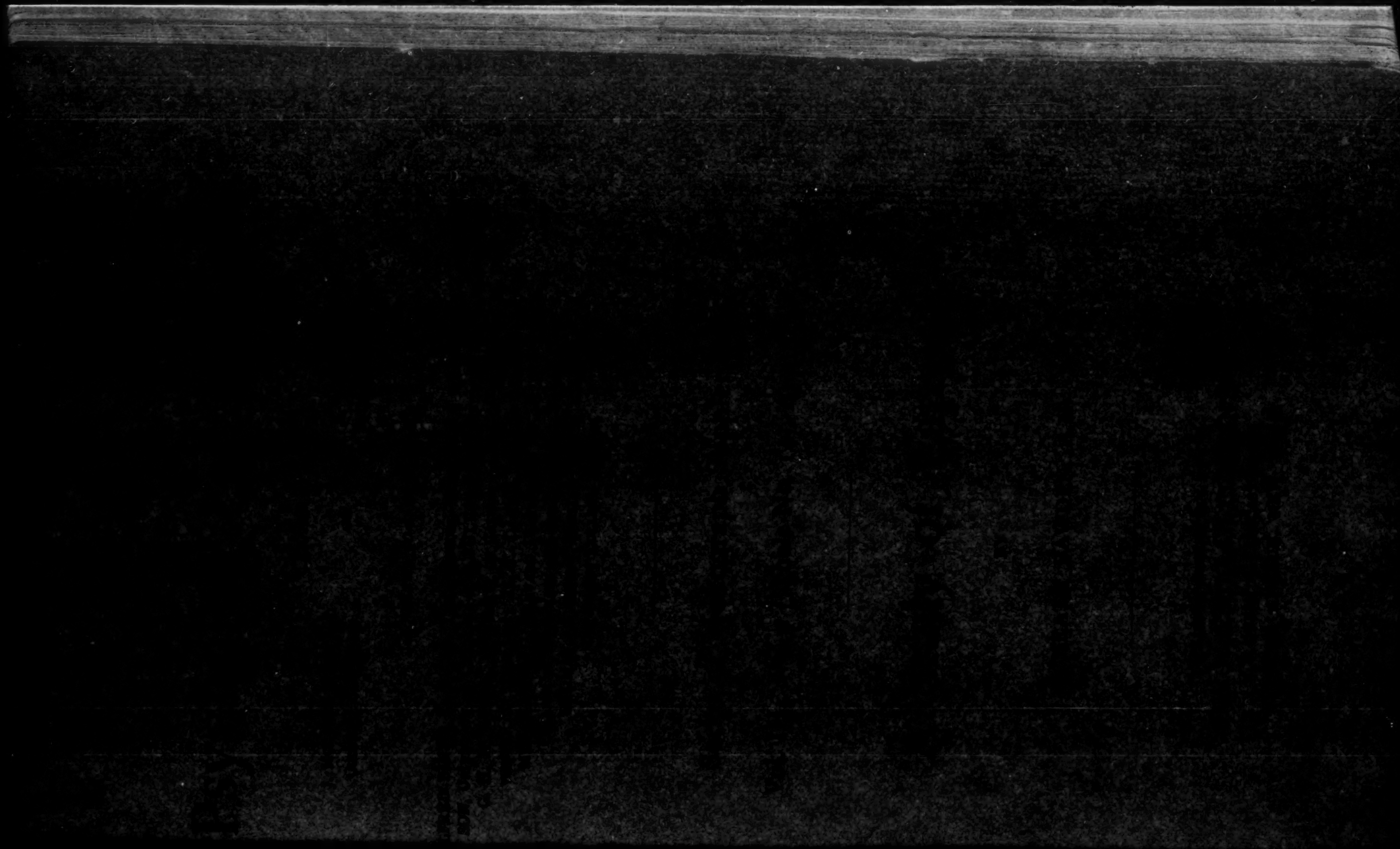

THE

Psychological Review

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Series of Monograph Supplements,

Vol. III., No. 4 (Whole No. 14), April, 1900.

A Study of Lapses

BY

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PUBLISHED BI-MONTHLY BY
THE MACMILLAN COMPANY,
41 N. QUEEN ST., LANCASTER, PA.
66 FIFTH AVENUE, NEW YORK.

PRESS OF
THE NEW ERA PRINTING COMPANY,
LANCASTER, PA.

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A STUDY OF LAPSES.

BY H. HEATH BAWDEN, A.M.

I. Introduction.

Every one has experienced those unaccountable lapses in thought and expression which form the subject of this study. Ordinarily they come and go, attracting little or no attention; or when unusually striking elicit only a laugh or a passing smile. But occasionally one occurs of such extraordinary character that it excites comment and inquiry as to its causes and probable significance in relation to mental life in general. Professor James mentions the case of a man who said he was going 'to the coal to buy the wharf,' and the writer heard a friend say that he was going out for a walk in order to 'get a bresh of freath air.' Another asked at the druggist's for some 'Phosford's Acid Horsephate,' and inquired for the 'portar and mestle.' Says Baldwin, "We often speak or write words which we do not mean and have not been thinking of."[1] A slip of the tongue or pen has often led to unexpected and unwished for results. Who has not inadvertently said just the thing it was most desired to conceal? Who has not unintentionally distorted words and even sentences into incongruous forms by reason of haste or nervousness? A man who was abruptly obliged to answer an impertinent question, asked by a young man named William concerning the name of another young man to whom reference had been made, confusedly uttered just the name which he wished to keep secret. He answered: "Really, Fred, I cannot." He intended to say: "Really, Will, I cannot tell you who told me." 'Fred' was the very name he wished to conceal. The case is cited as authentic of a "lady who accepted a proposal of marriage when she intended to refuse it, simply through the addition of one or two small words to her letter."[2]

[1] Feeling and Will, p. 283; cf. p. 60, footnote.

[2] F. W. Edridge-Green, Memory and its Cultivation, p. 190.

Instances are not infrequent in which the word 'glad' is written in place of the word 'sorry' in letters of condolence.[1]

To cite instances of how words and sentences become distorted, a person accustomed to rapid utterance, intending to say 'original article,' said 'oriticle,' thus dropping the latter part of the first word and hitching on the latter part of the second. Another person said she must 'go out on the corch to pool.' Another said, 'The pastor cut the shermon sort.' Still another caught himself saying, 'My squair' for 'My chair squeaks.' A public speaker said 'Your presence is recorded' for 'Your presence is requested by order of the President.' Another said 'cumbersable' for 'cumbersome or practicable.' Other instances are 'pice-peape' for 'Peace-pipe,' 'clink thearly' for 'think clearly,' and 'that doesn't hoften' for "that doesn't happen often." A professor in his class-room inadvertently referred to the 'tropic of Cancercorn,' intending to say 'the tropic of Capricorn and of Cancer.' A mother fondly remarked that her child was a 'dear, good girling,' meaning to say that she was a 'dear, good, darling girl.' Another said she must take her 'ba-boyby out for a ride.' A physicist said that he feared he should 'get the instrument out of needle,' when he intended to say that he feared he would 'get the instrument out of level and deflect the needle.' A father told his son to 'put the barn in the cart,' instead of 'put the cart in the barn.' A sister told her brother to keep his 'cleeth tean.' Yet another said, 'Your finger-neels' for 'Your finger-nails need cutting.' A writer in the *Atlantic Monthly*,[2] in an article on 'Heterophemy,' records the case of a young lady who to her own intense mortification often reverses her vowels. "One summer evening she was sauntering with a friend towards the post-office of the little town where they were staying. On the way they encountered an acquaintance with a handful of letters. 'Ah, good evening,' she said, in her peculiarly gracious manner, 'Are you strailing out for your mole?'"[3]

[1] Cf. the same work, pp. 151–152, where such instances are treated under the title of "Revival of Components."

[2] Vol. LXXV, pp. 431-432.

[3] This is, of course, inaccurately reported, even if it actually occurred, as will appear later. It should be reproduced graphically as 'mōll.'

Another person spoke of all his misfortunes coming upon him in one 'swell foop.' One who deals with lapses soon becomes familiar with such things as 'beas and peans,' 'wesert dastes,' 'Sophomen and Freshmores,' 'withered lose-reafs,' and other things too numerous or too curious to mention. A sentence composed entirely of lapses probably would read something like this: "Nast light I stook pecial spains to get the quettl sestioned as to how the Saniards were spettled." This meaningless jargon is composed of actual errors perpetrated at one time or another in the course of conversation by different persons. One is reminded of the strange utterances of the aphasic patient. Multitudes of similar errors might be cited.

The lapse always comes as a surprise to the reader or writer himself. It is out before he is aware of it. Frequently it will escape him altogether. A study of lapses is a study of automatic, not of voluntary mental process, since the errors are perpetrated before they are recognized as such. The lapse is as truly an involuntary act as that of the absent-minded man who draws his stocking over his shoe or blows out the gas, or that of the woman who smells her watch to see if it has stopped. A friend relates the following experience: "I was reading along on a double-column page, glancing up now and then, when the word 'tobacco' unaccountably loomed up in consciousness. Looking back and ahead in the same column I could find no trace of it, and gave up the search, thinking that it probably came in from some outside suggestion. I afterward found it, however, in the right-hand column, where it occurred almost exactly opposite the point where it intruded itself in the left-hand column. Doubtless it made its impression at the moment when, in the excursion of the eye while reading the first column, it fell upon the second." The writer had a similar experience in looking up from a book which he was reading (Nursery Rhymes) to amuse the baby who was tugging at his chair. I said, "Baby! Oh, Croakety, Croakety, Croak." I was surprised to find myself repeating these words to the child, and wondered what could have made me say so unusual a thing, when my eye fell upon the page of Children's Rhymes before me, which contained these words, though I had

not as yet consciously read them. Another instance may be cited. After jotting down a line of thought suggested in reading a paragraph in which the word 'explicative' occurred, I was surprised to find it reverberating in consciousness. Not recalling that I had read the word, I looked to see if it was suggested by the text I had been reading, and, of course, found it, when it immediately ceased its clamor. It is interesting to note that when first conscious of the word I was pronouncing it *sotto voce* with distinct movements of the lips. Lapses are thus what Professor James would call 'fringe' products of the conscious mental process. If we could only reverse the process which the mind goes through in attempting to read an illegible letter, we would find in the motor process of expression just those incongruous errors which flit before the mind in attempting to decipher the signs and symbols which were intended by the writer to convey definite ideas. Lapses begin as semi-conscious inhibitions and overlappings. They may end fully conscious as product, but never as process. Even as mental products they often escape one entirely, so that when confronted with an error that has just fallen from his lips, one is disposed to ask with the Ancient, *Ubi lapsus? Quid feci?*

The foregoing examples, it will be observed, are all oral errors. These are more complex and interesting as a rule, though not always more instructive, simply because the average person speaks more rapidly than he writes. The following are representative errors in writing, taken at random from a large list of lapses. A woman, attempting to write her own name (which was Mrs. H. H. Borgoine), was at the same time holding a conversation with another person concerning a certain Mr. Porter. The result of this division of her attention was that she wrote, instead of her own name, 'Mrs. H. H. Porter.' Of a great variety of lapses these are typical: 'Ard' was written for 'Are distributed'; 'wisher' 'liker' and 'wither' for 'wish her,' 'like her' and 'with her,' respectively; 'John cambe' was written for 'John came to bear'; 'whold' for 'who hold'; 'if it it' for 'if it is'; 'clodium' for 'sodium chloride'; 'ank' for 'any kind'; 'Anothing' for 'Another thing'; 'Hig' for 'His fig.'; 'max' for 'wax model'; 'very soof' for 'very soon

after'; 'beneathe' for 'beneath the'; 'Sea, Dear!' for 'See, Dear!'; 'rember' for 'remember'; 'opposides' for 'opposite sides'; 'himsight' for 'himself in the light of'; 'id dit' for 'it did'; 'no dot' for 'do not'; 'scrace' for 'scarce'; 'sacred cat' for 'scared cat'; 'bother' for 'both taken together'; 'mend' for 'men and'; 'wright' for 'right and wrong'; 'growp' for 'growing parts'; 'the forg' for 'the form which an organ takes'; 'tace' for 'taste nice'; 'eath' for 'each other'; 'you make' for 'you may keep'; 'frow' for 'from now'; 'of they' for 'of the eye'; 'each set when they are set' for 'each set when they are sent'; 'What are the neurochord and the neural tube'? for 'What are the notochord and the neural tube'? Here we get the *disjecta membra* of speech, the wraiths of incoming and the ghosts of departing words. Any one who has served as subject in reaction experiments for association in the psychological laboratory knows what the feeling is of catching at the rag-and-tag ends of ideas that are struggling to take on definite word-forms. This is what we get in the case of lapses.

Now just as little irregularities in the road enable one accustomed to it to make his way in the dark, so to the student of human nature little 'inadvertences in expression,' 'aberrations in speech,' 'lapses of thought,' 'confusions of ideas,' 'hitches' or 'slips' in speaking or writing (*lapsus linguæ* and *lapsus calami*) are sometimes most useful and unerring guides in the understanding of mental process. Neglected trifles are sometimes suggestive of most fruitful problems for research. Professor James says: "The great field of new discoveries is always the unclassified residuum." Lapses belong to this category. Such minutiæ become valuable chiefly, however, only as they are collected in great numbers and interpreted in the light of inductive generalizations from a wide range of data. A vast body of facts must be accumulated before their connections and dependencies can be made apparent. Accumulation of such data is necessarily slow, since the most instructive errors often occur at times when it is impracticable to record them. Yet many may readily be noted when one's attention has been directed to the subject and their value as psychological material has been pointed out.

This study has a two-fold aim: first, to set forth a comparatively new range of phenomena, of which the above are examples, and, second, to propose general lines of interpretation for these phenomena.

II. General Survey of the Problems Involved.

The Conditions of the Lapse.—On the testimony of the persons who made the errors lapses were variously caused. A lapse is usually accounted for by the person making it in one of three ways. It is due either (1) to the *lack* of sufficient attention, caused by thoughtlessness, hurry or nervousness (cf., *e. g.*, what further on are called persistent transpositions and substitutions); or (2) to *over* attention (cf., *e. g.*, anticipations and insertions); or (3) to a *divided* attention in a case where two objects, either both external, one external and one internal, or both internal, strive for the focal point in the field of consciousness (cf., *e. g.*, modifications of consonants and vowels, and exchanges). The first of these may be regarded as belonging to the general class of fatigue phenomena. The second and third types belong to what Stout has called conflict or competition.

The conditions described by introspective analysis on the part of a person making an error can, of course, be only in the most general terms and relatively inaccurate, since lapses are phenomena of motor automatism. Whatever the conditions may be, they can be discovered only indirectly, since, in addition to the error in its already completed form, we have no facts or introspective data with which to deal. These errors are not the product of artificial, in the sense of voluntary effort, but are purely subconscious in origin. Even in the errors produced under experimental conditions there is no hint of what sort of an error will result, until it is actually seen or heard. The first experience of the person making the error is the auditory or visual perception of a lapse; *e. g.*, a word is recognized as having been spoken or written in a connection where it has no meaning or gives a meaning which was not intended. Collins[1] thus describes this process in the case of oral errors: "If

[1] Faculty of Speech, etc., p. 251–252.

when one is speaking aloud a word is misplaced or a word is not used in its proper sense, if there be made what is called a *lapsus linguæ*, the auditory area, which is keenly alive to the slightest misuse of words, quickly detects the error and communicates it to the intelligence or carries it into consciousness. This in turn calls up the articulatory image of the proper term, which is then articulated. The sound of every articulated word acts as a stimulus to the auditory centre for the next." An analogous description holds for graphic errors. The important point to notice in this connection is that the error never is detected *until after it has been made*, and, except indirectly, there is no control over the organs involved which can prevent such errors in the future.[1]

Strictly speaking, of course, the proximate causes of errors are exclusively neither central nor peripheral, but partly both. There is good reason to believe that in *all* verbal association there are so-called sensory (peripherally excited) as well as motor (centrally excited) factors. It is sometimes a question whether the disability results from interference with the formation of the mental content (in the process of the interpretation or construing of the stimuli) or in the emission, in the expression, of what has been rightly interpreted. It is quite impossible to determine this point on purely introspective grounds. Certainly it is impossible to exclude such immediate causes as stiffness of the lips, immobility of the hand or fingers, fatigue, cold, nervousness, preoccupation, distraction, etc., on the side of the organism, and such obstacles as slight irregularities in the dictation or on the printed page (inaccurate articulation, poor type, etc.), on the side of the external stimuli. The influence of the latter, however, has been reduced to the minimum. In lapses, then, we have to deal with phenomena which, even in their simplest form as artificially isolated in the laboratory, form a complex of processes. The peripheral alternations of stimulation are far too complex for any but the roughest measurement. Even less computable are the fluctuations of circulation and respiration which undoubtedly affect the centrally excited pro-

[1] A striking confirmation of the general doctrine that the activity experience is always reported in consciousness in terms of sensation and feeling alone.

cess. The fact that in so-called motor aphasia the faculty of mere mechanical copying (sheer imitation) is frequently retained,[1] while the power of interpreting what is written (intelligent copying—the translation of the symbols into internal language, into meaning) is entirely lost, shows the high degree of complexity of such a process as the ordinary intelligent act of writing.

The specific occasions of errors, mentioned by the persons making them, are as follows: (1) Too great speed or hurry; (2) embarrassment, bashfulness, or reticence; (3) nervousness or worry; (4) fatigue, weariness, exhaustion; (5) preoccupation from within or distraction from without; (6) absent-mindedness; (7) confused ideas or conception of the subject-matter; (8) hesitation in choice of words (especially between synonyms); (9) blank stupidity or mental vacuity; (10) carelessness, inattention, neglect. (11) One fruitful source of errors is a complete or incipient state of reverie. The word or sentence is initiated in good form by the voluntary attention, but, due to a temporary diversion, makeshift combinations ensue. There is just sufficient attention to secure an expression of some sort, but also sufficient disorganization or fluctuation of the attention to make that expression take an incomplete or erroneous form. (12) Many errors arise from difficulty of pronunciation or writing. Lists of such cacophonous juxtapositions of letters and words are appended below.[2] (13) Many curious cases arise, also, out of peculiar methods of abbreviating words and sentences in rapid writing: for example, one writer's usual abbreviation for such an expression as 'fact of being' is 'fact of bg.' In the rush of composition he wrote 'facting.' This is a single example of what may be called condensation-errors or abbreviation-lapses. Others will be found scattered throughout the tabulations. (14) Many errors do not find their way into the tabulation simply because there is no certain mark by which to classify them. An example is the following, which is only a sample of myriad others. A lady wrote as follows: "I was glad to get your letters and delighted y" for 'delighted with.' No reason immediately appeared for the error, and she was sur-

[1] The same is true of mechanical reading.

[2] See Table I, and cf. second column in the other tabulations.

prised to find that she had written the 'y' and thought for a moment that, of course, 'with' began with a 'y.' The only possible explanation of the error was the 'y' of the word 'your,' which was just above it in the preceding line, but the presence of this 'your' did not come into the consciousness of the errorist.

Grouping the above approximate occasions of error according as they belong to the fatigue phenomena or to the phenomena of conflict or competition, they may be stated as follows. (1), (3), (4), (9), (10), (11) may be regarded as due to the effects of fatigue, in the broad sense of that term. Thought runs away from execution. The organism does not respond to the stimulation; as the common expression goes, we 'are not equal to it!' On the other hand, (2), (5), (6), (7), (8), (12), (13) may be regarded as due to conflict or competition. Here the functioning of the organism is altered or brought to a dead-lock by reason of opposing stimulations, as for instance when one attempts to carry on a conversation while composing a letter; as the common expression goes, we 'get all wound up.'

Table I.

List of Cacophonous Juxtapositions in the Pronunciation or Writing of which Errors were Made.[1]

In Pronunciation.

Nova Scotian coal fields
Sinking ship
Hymonymous hemianopsia
The superhuman energy of a ferocious archangel
Æsthetic satisfaction
Details which lack objective purposiveness
Chants a rhythmic catechism
Indefatigable disinterestedness
Wit is an approximately instantaneous revelation
Development in individual
Indissoluble unification
Peculiarly difficult complications
Mainspring since still strongly stirred
A current propagable purely by hand
Stretched string
The ignition of such rapid inflammables
There is still a strong tendency
That single shore-side street
We see in him an image
A Spanish cavalier and an Italian physician
I looked up at the artist's dark intelligent face
Betrayed his strange mastery

[1] These are samples merely.

Irks care the crop-full bird; frets doubt the maw-crammed beast
Anything reticulated or decussated at equal intervals
Has not habitually
Shadworth Hodgson
Maintains the minimum characteristics
Strand so strengthened
Incomputable but irrefragably certain
He was rhythmically reeling off cachinatious retorts
Pronouncing ponderous polysyllables
Dainty bits enrich the ribs but bankrupt quite the wits
I found the wayside inn by Castlenuovo's few mean hut-like houses huddled together on the hill-foot bleak
Save as thou teachest us
Our only anthem and hymn
A sharp spear of pain
Silk purses are not made from sows' ears
The grief that gazes at a grave
Bask, ask, task
Various salts and gases
Miles distant
Lashing furiously
Hawaii and elsewhere
Organism consists
Sixth seal
This joint-sense test
Statistics

In Writing.

Earliest stages
Philadelphia and Egypt
Sudden dawning
An analogous
Who hold
An auditory age
Lest my Lord be
Development in individual
Feelingful
Three hundred acres
Absent-minded man at the moment
Some thick, some thin
On the first bed, though in a lions' den
Sixth seal
Conflict and morbid conscience
Rapidity with which
Solved in the initial assumption
Two-toed sloth
Alliteration
Catechism
A series of fault lines
Regarding the two as homodynamous
The fossil botanist
Fundamental antithesis
From that of hoofed Herbivora
Denominational college
We see in him
It is wonderful what
Remember
That an organism
Our own resources for research work
Sends the shivers
Whom something
Have not habitually
Concrete realities
Begun on
Quadrigemina
The thought into the thing

In the outward form
Know nothing
Another thing
At different times
Harvest time
Graphic characters
Granular layer here
Are equally
By proliferation
Right and wrong
Shoulder the burden
Pusillanimous
The hitherto true tone
Before fully

To make a statement of the conditions of the lapse on the objective side, that is, in terms of the still embryonic science of cerebral physiology, is much more difficult. The most that can be done is to state plausible hypotheses. The fact that articulate and written language may be produced without errors during unconsciousness (hypnosis, etc.), and the fact that such errors as do occur in conscious life are products of sub-liminal processes, show that the conditions of the phenomena we are here dealing with must await statement in terms of the cortical processes involved, since there are practically no immediate introspective data in terms of which a statement can be made. In speaking or writing I concentrate my attention on one letter or syllable, on one word or sentence at a time, according to my previous training; but there is always a going and a coming marginal part of the sentence or paragraph which is also more or less vaguely in consciousness. It is out of the confusion or conflict of the various elements forming this visual, auditory or kinæsthetic marginal content, that all we know introspectively of oral or graphic lapses arises. The real conditions of these 'marginal' or 'fringe' processes of combination are seldom, if ever, within the scope of introspective observation. They have to be worked out indirectly and in neural terms. When an error, ostensibly in the terms of psychology, is called a fluctuation or aberration of the organic or involuntary attention, this is the same thing as saying, in physiological terms, that there is a 'hitch' in the organic adjustment. The so-called organic attention is nothing but physiological or neural process, viewed as the factor *conditioning* a certain series of conscious experiences. As to the neural relations which produce an error, the most that we can say is that it probably results from an antagonism of dynamic systems. As Leuba says, "The reflex arc processes are com-

bined in two groups, and end respectively in muscles coördinated for contrary actions."[1] The result is primarily only a physical antagonism, but it is reported in consciousness as conflict or competition. Its genesis in the neural coördination, or rather mal-coördination, is, however, the only adequate explanation. Often the hybrid products of such conflict find their way into clear consciousness only after their complete formation beneath the threshold, while yet they are felt to be the resultant of a complicated process of growth. In such cases they are recognized in experience as examples of assimilation, or more specifically as cases of coalescence. The problem of lapses as considered in the following treatment is restricted to its statement in terms of association, which deals with them chiefly in their form as mental products. But certain further questions propose themselves as to the cerebral conditions, which we may pause simply to state, before passing on.

An interesting query arises whether lapses, both oral and graphic, may not, some clearly, others less definitely, be due to an incipient aphasia or agraphia? At least, must we not say that they are due to a momentary mal-coördination in the corresponding cortical areas—and what is aphasia but a similar phenomenon on a larger scale? Certainly, the frequency of errors in an individual sometimes reaches a degree and a constancy which might well be called a transitory or local aphasia, or paraphasia. Such would be what is called functional aphasia, doubtless often simply cases of temporary exhaustion through over-expenditure of nerve force. Since the speaking or writing returns almost immediately to its normal form it is evident that the disturbances in most such cases can be only transitory.[2] It has long been recognized that defects of speech may be due to disease (aphasia). It is now recognized that bad spelling as well as bad pronunciation may be due to cerebral lesion (agraphia). Aphasia (in the broad sense of Asemia) results from lesion of the zone of language, or of the pathways leading to or from it. These may relate to the reception (inter-

[1] *Am. Jour. Psychol.*, July, 1897, p. 531.

[2] Ballet (Le Langage Intèrieur, p. 78) remarks on the gradual stages which intervene between functional verbal amnesia and aphasia.

pretation) or emission (expression) of language. Lesion in the case of the first constitutes what is called sensory aphasia; lesion in the case of the second constitutes what is called motor aphasia. The literature of aphasia is very large and forms a distinct department of mental pathology. Of this we do not intend here to speak except to call attention to the likeness of these pathological phenomena to the facts under consideration. In certain conditions of the nervous system the agraphic patient will almost invariably write 'ot' for 'to,' 'tub' for 'but,' etc. In another slightly varying form, instead of 'the' the first letter is omitted, while in longer words the letters and syllables are often so distorted that it is difficult or impossible to get the sense. This simple type of misspelling or mispronunciation is not confined to persons who are acknowledged to be agraphic or aphasic; it occurs also in the normal experience. The chief difference seems to be in the frequency and variability with which they occur. The same mistakes will be made by the normal and by the abnormal individual, but in the former case the error is variable, while in the latter case it tends to be constant. For example, one person in rapid writing from dictation frequently writes 'tub' for 'but,' and like the aphasic patient drops the first letter of 'the,' yet this is the exception and not, as in the aphasic patient, the rule. The resemblance between oral errors and aphasic expressions is of too common observation to require illustration.[1] Many cases of real aphasia doubtless pass simply as unusual difficulty in speech, or as what are here called *lapsus linguæ*. The following agraphic material illustrates sufficiently the similarity which exists between the normal and the abnormal expression. It is arranged in columns for convenience of comparison. With this may be compared the graphic lapses in the tabulations below.

Error.	*Correct Form.*
Drar Ser	Dear Sir,
I wont too sells	I want to sell
three Hudderd acers	three hundred acres
of lande foe actage	of land for a house,

[1] Interesting examples are cited, for example, by Bastian, Brain as an Organ of Mind, p. 668 f.

six Rooms rick and Saliage Hous Mtht Barnis and Shedes and a Poller yard close in Denver.	a six-room brick cottage, with barns, sheds, and a poultry-yard, close to Denver.
Roydnendd navendendd ofor endendd Belondendd.	Royal naval medical office belonging to the Admiralty.
The assoil lens a puff piff miss corres povety.	The Odessa line is again working properly.
omdern schrussen schreigen butter Willeer Dotson	modern grussen schreiben mutter William Dotson
The peole enjojm evfoves themseds.	The people enjoyed themselves.[1]

Does such resemblance confirm the theory that every person is mentally a little unbalanced, and that education from this point of view is simply the attempt to secure and maintain mental equilibrium, which, however, is never actually attained? Sleep, it has recently been suggested, is a periodic lapse of consciousness due to a certain contraction of the nerve elements.[2] Of essentially the same nature may be the approximate cortical conditions of the lapse. One writer has suggested that possibly the central condition for many of the errors made by the normal person in speech and writing, as well as in many other forms of motor coördination, is a momentary playing over against one another of the two cerebral hemispheres (that is, in the case of lapses, the bilaterally situated, though unequally developed, oro-lingual and grapho-manual centres). Another has suggested that possibly an uneven suffusion of the cortical areas concerned, due to some abnormality in the general circulation, occasions errors

[1] The above cases are nearly all taken from Eskridge, *Med. News*, Aug. 1, 1896, pp. 9, 122.

[2] M. Duval, Théorie histologique du sommeil, C. R. Soc. de Biol., 1895 and 1898.

in speech and writing, somewhat as minute granules in the humors, or opaque bodies in the lens of the eye obscure vision. But such general suggestions have little value in lack of detailed application and explanation.

Stricker[1] and others have called attention to the insufficiency of any theory which assumes a corresponding multiplicity of cerebral elements for the different words, letters or parts of letters used in speech or writing. He emphasizes the fact that the words which we speak or write do not exist in the brain as heard or seen; we construct each word out of the heard or seen images. He likens the cerebral apparatus in this respect to a modern type-writer in which there is a key for each sound. We begin life with simply a cerebral apparatus for the reception, registration, coördination and expression of sounds, and the meaning-ideas associated with these simple sounds or complexes of sounds (this would be true also of visual symbols) are developed by gradual stages of growth from these simple conditions. This is borne out, he says, by the facts of the development of speech in children. The child first uses only a few simple sounds. Later he unites these sounds into simply constructed syllables. Then these are framed into short words or fragments of longer ones. These fragments are finally united by the simpler connectives with other syllables and word-fragments. Thus develops articulate speech. The growth of the speech and writing faculties is conditioned upon the degree of adaptability and the amount of actual practice; learn by doing is the law. But here again, supposing this to be in general a correct statement of the process, we are lacking in specific details on the neurological side.

On one morē point just a word: With regard to the problem of the localization of function in the cortical areas there are two general theories: (1) one which holds that there must be a separate coördinating center; and (2) an opposing theory which denies the necessity of a separate mechanism for coördination. According to the first view there must be at least a kinæsthetic (articulation or inscription) word center, an auditory word center and a visual word center—all sensory. For these to coöperate

[1] Studien über die Sprachvorstellungen, pp. 34, 77.

in the production of speech or writing there must be another, a coördinating center. According to the second view it is necessary only to suppose a certain relation existing between these centers. The latter is at present the view which harmonizes best with the whole range of the facts.[1] This has a bearing upon what will be said later as to the factors of verbal association.

Lapses and Sense-illusions.—It has been said that lapses become known first as errors in expression, though they may originate as errors in thought or idea. Even mental pronunciation, in which errors frequently occur, is a form of expression —a motor as well as a sensory process. Yet lapses differ from sense-illusions only in that the emphasis in the first case is on the motor, while in the second case it is on the sensory side of a sensori-motor arc. When the humming of a mosquito in the ear was mistaken for band-music playing at a distance, and when the low whistle of a distant locomotive was mistaken for the humming of a mosquito, we are dealing with sense-illusions. But when a person inadvertently speaks of the 'dosy rawn,' 'hale and dill' and the 'coss crat' instead of the 'rosy dawn,' 'hill and dale' and the 'cross cat,' we are dealing with errors of the motor type, which, though conceivably originating as sensory, become known only as motor errors. It is impossible in the present state of knowledge to draw an absolute line between the purely sensory and the purely motor types of error, since we become aware of the sensory only through the motor end of the process. We know, however, in a general way whether the peripherally excited or the centrally excited factors in an error predominate. In the former case we classify the error as a sense-illusion, or, as treated here, a peripherally excited error (sensori-motor in the restricted sense). In the latter case we classify the error as a lapse proper, or as a centrally-excited error (ideo-motor in the general use of the term).

The problem here arises as to whether lapses are essentially errors in the interpretation of the sensory presentation or errors in the expression of what has been rightly interpreted. Theo-

[1] Cf. R. Sommer, Zur Theorie der cerebralen Schreib- und Lesestörungen, *Zeitschr. f. Psychol. u. Physiol. d. Sinnesorgane* (1893), V., p. 319.

retically there are four possibilities. They may be (1) Errors in interpretation (the sensory end of the process), (a) not followed by a subsequent error in expression, (b) followed by such a subsequent error (a double error); or (2) Errors in expression (the motor end of the process), (a) of what has been rightly interpreted, (b) of what has been excogitated (in which there is no discoverable element of interpretation). The motor expression of a sensory error in interpretation would, accordingly, not be strictly a motor error, for the motor end of the process would be perfect, only it would reproduce what is contrary to reality. To illustrate—A pupil understood his teacher to say 'Bible,' and wrote the word thus, what the teacher really said being 'fibre.' Similarly, a child understood its teacher to say 'pound her dominion,' and so wrote it, what the teacher really said being 'pawn her jewels for her dominion.' In these cases the error was obviously in the sense-perception, not in the graphic (*i. e.*, motor) reproduction. But in the case of the boy who said he had 'jot a golly apple' and the girl who said she had an 'awful home-strick seak,' we are dealing with lapses involving a mal-adjustment of the motor process. It is impossible in many cases, however, to determine whether an error belongs exclusively to the one category or the other.

It will thus be seen that we regard the sensory and motor aspects as simply two ends of the same organic circuit. Every mental state is a complex of peripherally and centrally aroused ideas. An idea aroused solely from without or solely from within probably never occurs. The question then becomes one in which psychology has to wait for physiology and neurology, rather than one which can be settled on the basis of mere introspection. Wundt says[1] that probably the great majority of so-called hallucinations are illusions, and that these illusions in their psychological character are nothing but assimilations. In other words, it is a purely arbitrary matter where you draw the line between the two ends of the process, the truth being that if you start with either end you inevitably run over into the other by a continuous analysis. An error, accordingly, is to be interpreted not only as a passive sense-illusion, but also as a

[1] Outlines of Psychology, p. 269.

sensori-motor, sometimes as an ideo-motor complex, which presents these two aspects according to the point of view from which it is regarded. It is in line with recent investigations of the dynamic character of consciousness to believe that in the speech and writing consciousness every expressive process is conditioned more or less directly upon a receptive process; that every motor involves a partial or complete reinstatement of a corresponding sensory process[1] or, to state it less equivocally, that every motor is but one aspect, or one end, of the same process of which the sensory is the correlative aspect or other end. Applying this principle, the same process, or sensori-motor arc, viewed from the standpoint of its centripetal aspect (from the point of view of interpretation), we call a sense-illusion: viewed from the standpoint of its centrifugal aspect (from the point of view of expression), we call it a lapse.

The distinction which is here made between sensori-motor and ideo-motor errors is based on the more obvious sources of the ideas involved. The sensori-motor are peripherally excited errors which find expression in the motor process. They may be called imitation errors, since they are always such as appear in oral or graphic reproduction. The oral occur in reading aloud or in repeating from dictation; the graphic, in the process of copying either from dictation or from the manuscript or printed page. The ideo-motor are centrally excited errors which find expression in the motor process. Here the sensory process, in the sense of involving the use of any of the ordinary avenues of sense, is absent or reduced to the minimum. These may otherwise be called origination or invention errors, since they occur always in the expression of excogitated thought. They are distinguished from those which occur as immediately and obviously due to a sensory process involving the use of some one or more of the senses. Just because ideo-motor lapses belong to the category of those mental processes which are centrally, rather than peripherally, initiated, they are the more baffling to investigation, because not admitting of experimental control. These might have been called ideational errors, except that they seldom enter consciousness before they

[1] Cf. Baldwin, Mental Development in Child and Race, p. 460.

are precipitated, the term 'ideational' rather implying a conscious process. The term 'ideo-motor' was first used by W. B. Carpenter for a muscular movement caused or prompted unconsciously by an idea. It is used here, since an error is usually unconsciously produced, the occasions facilitating the error, which comes into consciousness only after its precipitation, and then is not always recognized, often being entirely beneath the threshold.

Oral ideo-motor errors occur in impromptu speech, either in platform utterances or in conversation. Graphic examples are found in original composition, letter-writing, etc. Some examples will illustrate what is meant by these terms. First, four sensori-motor errors. In one the lapse occurred in the vocal reproduction of what was perceived through the sense of sight. 'Althey though' was read for 'although they.' In another the lapse occurred in the vocal reproduction of what was perceived through the sense of hearing. "Round the rugged rock the *rugged* rascal" was repeated after another person for "Round the rugged rock the *ragged* rascal ran." In two errors the lapses occurred in the manual reproduction (in writing) of what was perceived through the senses of sight and hearing, respectively. 'Dection' was written for 'detection,' and 'eather' for 'each other.' Compare with these, four ideo-motor errors, in which there is no discoverable sensory process (in the sense in which this term is used above), but simply a recombination of ideas or images, already existing in the mind, by the constructive use of the imagination. The first two are oral: the second two are graphic. "Have my tucket pinched" was spoken for "Have my ticket punched." "I fool so feelish" was said for "I feel so foolish." 'Can be asily' was written in a letter for 'Can be easily,' and 'will he' for 'will be his.' In Tables II., III. and IV. errors to which this distinction can be clearly applied have been grouped according as they involve (1) a conflict between two peripherally excited processes, (2) a conflict between a peripherally and a centrally excited process, and (3) a conflict between two centrally excited processes. Futher reference to these Tables will be made below, in the discussion of the various types of coalescence.

Table II.

Coalescence Due to the Conflict of Two Peripherally Excited Ideas.[1]

Error.	*Correct Form.*	*Remarks.*
as is carried	is carried	'i' visual, 'a' auditory.
away a f from its	away from its	'a' visual, 'f' auditory.
leeders	leaders	'a' visual, 'e' auditory.
violed a her	violated her part	'a' visual, 'a' auditory.
and exg bec	and declarative of	The *sound* 'f' coming just before 'g' (the series repeated was a–b–c–d–e–f–g) in the auditory series, changed 'c' to 'x.' The 'd' of 'and' took the place of the 'd' of 'declarative.' The 'b' of 'bec' came also from the auditory series.
on behalf in of othe	on behalf of the nation..	'in' came from the auditory series (which was 'in an end pond'): the 'o' of 'othe' persists from 'of.'
responisnbility fon	responsibility for	Influence of the 'n's of the auditory series.
i the etabisment	the establishment	'i' from the auditory series.
of good gonverment	of good government	Influence of the 'n's.
as in Cn his	as in Cuba his	Influence of the 'n's. Note that 'n' equals 'u' in handwriting.
with whnch	with which the	Influence of the 'n's. Note that 'n' equals 'u' in handwriting.
at 7 sfive oclck	at five o'clock	Same, only repeating 1–2–3–4–5–6–7–8: first wrote the figure 7, then started to spell it.
and for for lover thirty or veven fewer	and for over thirty or even fewer	'for l' from auditory series.
which f correspond	which correspond	'f' from auditory series.
There in sunversal	There universal	's' from auditory series.

[1] These are all graphic and experimental: the conflict was between a visual and an auditory stimulus (the subject was copying and at the same time repeating aloud the letters, etc., which appear under 'Remarks').

TABLE III.

Coalescence Due to the Conflict of a Centrally with a Peripherally Excited Idea.[1]

GRAPHIC.[2]

Error.	*Correct Form.*	*Remarks.*
cover the corn wells	cover the corn well.....	Letter-writing by a man whose name is Wells, and who had just been writing his name which was before him on the page.
l	elision	Thinking of 'lapse.'
The Good Subject	The Good Shepherd.....	Attempting to compose while also trying to keep the drift of a lecture in which occurred the phrase 'the good subject.'
punishman	punishment.....	'man' occurred in the lecture just as the word-part 'ment' was about to be written.
power of constraint	power of contrary choice	Ditto—in which the phrase 'freedom from external constraint' occurred.
congregational	congregation	Thinking of 'Congregational Church.'
in the direction of transmittion	in the direction of transmission	As the word was being copied, its derivation, 'trans-mittere' flashed into mind.
were circapble	were cirpable.....	In copying an oral error, the word 'capable' being in mind.
mom	somites.....	'myosomita' in mind.
quari	quadrilateral	'parallelogram' in mind.
e	I	'eye' in mind.
srack	crack	'store' in mind.
s	catfish.....	The words 'shell' and 'Spanish' were in the marginal consciousness.
woull	will.....	Experimental: 'would' in mind.

ORAL.[3]

Error.	*Correct Form.*	*Remarks.*
That's a perison	That's a period.....	In speaking: the word 'comparison' was on the page before the eyes.

[1] None of these are experimental errors except those so indicated under Remarks.

[2] The errors are in copying, unless otherwise indicated.

[3] In reading aloud unless otherwise indicated.

democrat	demagogue.....	Preacher reading from manuscript about election time.
Cis	German (His)	The idea 'Capital' in mind (in reading proof).
Looking for 'Mushroom'	Looking for 'Muscle'...	In speaking: 'mushrooms' on the page before the eyes.
possessing	touching	In speaking: 'possessed' before the eyes on the page.
One two	When two	Another person was just saying 'One, two, three, etc.'
f-th	v-th	Reading proof; had just pronounced the word 'fifth.'
Ganglican	Gallican	'Anglican' in mind: in reading aloud.

TABLE IV.

Coalescence Due to the Conflict of Two Centrally Excited Ideas.

GRAPHIC.[1]

Error.	*Correct Form.*	*Remarks.*
ideati	ideo-motor.....	'ideational' in mind.
idea	ideo-motor.....	'ideational' in mind.
ideomotior	ideo-motor.....	'ideational' in mind.
whether it bet	whether it be.....	'that' in mind: the intention was to change 'it' to 'that.'
8 ft.–8 in.	5 ft.–8 in.	Due to hesitation whether to use metric or English measure.
journey	journal.....	Thinking in general about a certain Journal.
Guadaquerque	Guadaloupe	'Albuquerque' in mind.
like a see	like a sea.....	'the' in mind: contemplated changing 'a' to 'the.'
Lima to Cylinder	Lima to Dayton.....	Clerk making out pass for employee while engrossed in the shipping of cylinders.
practices	practiced	The other form of the word ('practice') came to mind.
iron alum 4	iron alum, formalin 8 days ...	Confusion of the figure '4' with the word-part 'for': suffering intense pain at the time.

[1] The errors all occurred in 'composition' (as contrasted with copying), letter-writing,' etc

sid	see books.....	'*vide*' in mind.
Ill	Elisions	'illustrations' in mind.
we are yo	we are so	'you' in mind.
Knowing, Thinking	Knowing, Feeling	Hesitation in choice between 'Knowing' and 'Thinking.'
William James	William Jackson	The well-known psychologist's name in mind.
complexicty	'complexity	'complication' in mind.

ORAL.[1]

Error.	*Correct Form.*	*Remarks.*
winter March	winter month	'March' in mind.
liquals	liquids	'linguals' in mind.
ours would bump	ours would break	'our pump' in mind.
North-Weast wind	North-West wind	'East wind' in mind.
in the back part of the brain	in the back part of the book	'brain' in mind.
barg	larger margin	'bigger' in mind.
turn round	turn up	'come round' in mind.
polycotyls	polypetalous	'dicotyls' in mind.
think	thing	'mark' in mind.
ruver-shoes	over-shoes	'rubbers' in mind.
degreements	differences	'disagreements' in mind.
as soon as I have written	as soon as I have eaten..	The idea of writing immediately in mind.
The nights are begetting	The nights are becoming shorter	'getting' in mind.
dreeze	breeze	'draft' in mind.
It bost	It cost.	'butter' in mind.
headwards	Edwards	'headship' in mind.
perple	persons	'people' in mind.
Well, I'll spaddle you	Well, I'll paddle you	'spank' in mind.
trying to apploy	trying to employ	'apply' in mind.
six cents a quarter	six cents a quart.	'five for a quarter' in mind.
foot-sprints	foot-steps	'foot-prints' in mind.
symblem	symbol	'emblem' in mind.
emricron	omricron	'epsilon' in mind.
Look at that little puddle!	Look at that little poodle!..	'pug dog' in mind.
Jenarii	Genarii	'J' and 'G' (soft) confused; note the influence of the auditory imagery.
forwarth	forward	'forth' in mind.

It is probable that many of the errors which have been classified among those of impromptu speaking and conversation (oral) and original composition (graphic) are really to some

[1] The errors all occurred in 'conversation,' 'lecture' or 'address' (without notes), etc.

extent due to unconscious reproduction of obscured sensory impressions.[1] It is a question, in other words, whether impromptu speaking and spontaneous writing are not essentially such processes as occur in reading or copying from a book before the eyes, except that the copy is mental (cerebro-cerebral) instead of what we call physical (retino-cerebral). In reading, it is very plain that we do not read or even see all the letters or even all the syllables of a word, in order to recognize what it is and properly to reproduce it: a hint, a part of a letter, a loop above or below the line, is sufficient. This is probably the psychological truth in the statement that such persons as Macaulay could read by sentences or paragraphs rather than by mere words or letters. An educated person gets only a schematic perception of the units in a line or sentence or paragraph, the fulness of detail depending on his familiarity with the subject. For example, in the sentence "We swept the swan-down out of the room" we may think on first inspection that we take in most of the letters in reading the sentence; but in the sentence 'A huge complex of contradictories and self-destructive incompatibilities' it is evident to any one who knows the meanings of the words that only prominent or significant letters enter consciously into perception in reading it. These key letters or syllables are taken to stand for the whole. Now in the speaking or writing of what has been excogitated, as distinguished from reading or copying, it is probable that in a similar way the mental images of these and similar words do not include each and every letter or even all the syllables; they are rather outline skeletons. The less significant details are filled in automatically. Only when they are relatively unfamiliar or striking are they filled in consciously. Just as we find errors in reading and copying (the process of reproduction from the external copy), so there are lapses in the process of mental reproduction, from the internal copy, so to speak. The following error illustrates the impossibility of differentiating the factors of external and internal speech. A person in reading and translating from the German said 'through whuse' for 'through whose universal.' The German word ('allgemeine') was nothing like the English,

[1] Memory may be regarded as simply a prolonged after-sensation.

so that the error must have been made like any other ideo-motor error, the word *being expressed* coalescing with a word *about to be expressed*, the peripherally excited stimulus in this case simply serving as the condition for 'setting-off' this series of words (*i. e.*, setting up a different *central* process). From the outside, to any one who was not aware that the speaker was really translating, the error could not have been distinguished from any sensori-motor error peripherally produced. Such an example shows that, psychologically at least, the distinction between the peripherally and the centrally excited errors can not fruitfully be made the ultimate basis of interpretation and of classification. It is, furthermore, often difficult to determine whether to classify an error as sensori-motor or as ideo-motor, because of the memory factor. When an error is made in repeating, *e. g.*, a line of poetry or a passage of prose literature, it may be due either to a falsely interpreted sensory impression (either visual or auditory) at the time of committing the passage to memory, or to an imperfect motor coördination at the time of making the error. For example, in the following case shall we classify the error as sensori-motor (the passage was doubtless learned through either the organs of vision or of audition) or as ideo-motor? A preacher in repeating the familiar verse of Scripture said 'without remission' for "without shedding of blood there is no remission of sins." Here the error may obviously have been due either to an imperfect memorizing of the passage in the first place, or, assuming that these cortical impressions all existed in proper relation, it may have been due to some defect in the central coördination or the peripheral innervation for expression.

Principle of Classification.—The problem of the classification of the data of lapses becomes thus a difficult one; first, because of the number and variety of the data to be handled, and second, because of the complexity of the conditions which produce them. A classification based upon the composition of the mental content should be supplemented by a classification based upon the predisposition or functional conditions of the lapse. But before this is possible a greater knowledge of the cerebral conditions must be attained, and meanwhile some

flexible arrangement of the data already in hand must be sought. The classification here employed is a provisional one only, based partly upon the nature of the mental elements entering into combination, partly upon the nature of the attentional process involved, and partly upon the avenue of expression by which the errors become known. Upon this analysis, which is psychological, is grafted another, simply for convenience, which is purely mechanical, grouping the lapses accordingly as they involve sentences, clauses, phrases, words or merely letters. This classification may appear somewhat arbitrary in places, but this must be endured for the present as a necessary limitation due to the embryogeny of the subject. Especially in the more minute subdivisions will the analysis seem somewhat formal, *i. e.*, based upon verbal rather than upon psychological principles; but it must be remembered that convenience of reference is also in such a case a prerequisite, and a somewhat arbitrary classification which is elastic is preferable to a misleading, because premature, attempt to proceed upon purely psychological principles.

The possibility of such minute classification of material depends, of course, upon the certain ascertainment of the details in each instance and the rigorous exclusion of all doubtful cases. This has been done, many most interesting errors not being included in the tabulation because their details were so elusive as to escape accurate registration. Mistakes which are due to any known organic incapacity (chronic aphasia, stammering,[1] 'tied tongue,' etc.), or to any peculiarity of stylus, typographical errors, etc., are not recorded. This study is restricted to the examination of verifiable data, not because there are not multitudes of non-authentic cases at hand which would be very instructive (probably many of them of actual occurrence); but the material which can be verified is so rich and plentiful that it would be quite unnecessary to expose one's self to the charge of an unscientific collation of facts. Suggestions for the inter-

[1] Stammering occurs in writing also, though it is comparatively rare. R. Dodge cites his own experience in his 'Die Motorischen Wortvorstellungen.' He regards this phenomenon as due to the conflict of the articulo-kinæsthetic with the grapho-kinæsthetic imagery. (See further below.)

pretation of many such non-authentic errors for the psychology of the ludicrous are made in a subsequent section.

Many errors belong at once to several categories, illustrating, for example, in a single instance what are called in the tabulation persistence, anticipation, elipsis and transposition. To cite a single case, which shows these four characteristics upon analysis, 'asll' was written for 'well as.' The forms of error involved in this lapse are (1) the anticipation of *as*, (2) the elision of *we*, (3) the confusion resulting in the persistent transposition of *ll*, and (4) the hybridization or uniting of parts of two words into (in this case) an unmeaning compound. There are many errors which can be no better described than as jumblings of letters or words—apparently lawless reconstructions or recombinations of letters or words, often suggested by some insistent idea or by some anticipated form, but never definitely, and usually without any discoverable occasion.[1] In most cases, in the tabulation, at least three subdivisions of the classification are represented by the center-head title. The columns which follow contain, respectively, the error as it occurred, the correct form (*i. e.*, the intended form), and explanatory or commentary remarks (see tabulations). In what here follows two main principles of division will be considered—(1) errors as oral or graphic, (2) errors as verbal and literal. The other principles of division will be developed in the subsequent treatment.[2]

It has seemed useful to classify lapses according to their character, whether oral or graphic—two different cortical areas and peripheral musculatures being concerned. This has the advantage of being a physiological as well as a psychological mark of distinction, and has thus a superiority over the possible, but more arbitrary classification upon the basis of the individual, occasion or subject, language or dialect, or merely verbal characteristics, which if used at all should be reserved for a subordinate category. By visual-vocal and auditory-vocal sensori-

[1] Such have been for the most part reserved for further consideration in the light of the evolution of language (the genetic study of lapses).

[2] The author wishes here to express his gratitude to those who have kindly furnished him with much of the data used, and to add that further material which any readers of this article may desire to put into his hands will be welcomed. Address H. Heath Bawden, Granville, Licking Co., Ohio.

motor errors are meant errors which, occurring in the sensory processes of vision or hearing, are reproduced in a motor process by the organs of speech. In oral errors a digraph made up of vowels is treated the same as if it were a simple vowel; the same is true also of consonantal digraphs. Occasionally oral errors occur, especially when there is a modification of the vowel sound or sounds, which cannot be recorded without explanation. In all such cases the necessary comments are made in the third column under 'Remarks.' Some of the errors tabulated were made in what has been called mental pronunciation or in mental writing (*e. g.*, in dreams).[1] For example, one person in reading to herself ('mentally'), from the newspaper, read 'five thousand walls of roll-paper' for 'five thousand rolls of wall-paper'; another read 'lings' for 'lungs and wings'; another, 'dame, leaf and blind' for 'deaf, lame and blind'; still another read 'to roll untangled records' for 'to unroll tangled records.' Other cases will be found in Table VIII., below. But these errors differ in no significant way from those made in ordinary vocal speech or externally visible writing. Obviously this relative identity of character is just what one would expect from the fact that the same musculatures and the same central processes are employed in the two cases.

By visual-manual and auditory-manual errors are meant errors which, occurring in the sensory processes of vision and hearing, are reproduced in a motor process by the organs used in writing (the arm, hand, fingers, etc.). All the graphic errors here recorded were made in handwriting (long-hand) except such as were made on the key-board of a typewriter, examples of which are grouped together in Table V. Many graphic errors were made in passing from the end of one line to the beginning of the next. Though numerous, but few of these are here recorded. Most such cases of simple reiteration seem to be due to a sudden backward thought to recover the broken thread of the sentence and a failure to note the precise point of previous termination: it is likely to take place in the unimportant words. Examples are 'haste to to' for 'haste to,' 'courses to to pursue' for 'courses to pursue,' 'both both tragedy' for

[1] Taken together these constitute Ballet's 'le langage intérieur.'

'both tragedy,' 'time in time in' for 'time in,' etc. The faulty numbering of pages in which the same number is repeated, belongs here. Cases are frequent also in which the wrong letter is crossed or dotted, as when in writing 'not be too much,' the *b* of 'be' by anticipation was crossed instead of the *t* of 'too.' Everyone is prone in rapid writing to dot the wrong letter. Such cases have not been entered into the tabulation simply because it would have swelled the latter beyond desirable dimensions.

The different forms of amnesic agraphia, in which through a partial weakening or total loss of the memory for graphic images, voluntary writing becomes very difficult or impossible, are illustrated in their incipient forms even in ordinary life in such very frequent cases of the forgetting of graphic symbols of different sorts. Agraphia in its beginnings is often not recognized as abnormal. In so far, however, as the forgetting of the graphic symbols attains a certain degree and frequency, it is attributed to some serious cerebral lesion, which our still crude clinical manipulation attempts to remedy, and the disease is then dubbed with a scientific name, agraphia. The fact is that the most classic and pedantic of us are both aphasic and agraphic at times, and sometimes all the more because fastidiously accurate, and life is little more than an unsuccessful attempt to keep from making either serious or ridiculous mistakes. Amnesic agraphia, says Preyer, can be limited to but a single letter. This is shown by the well-known suggestion experiment,[1] in which the hypnotized individual is persuaded no longer to write this or that letter, such as *e*, and in which after awaking he notices that he has written, for example, 'dn lftn Sptmbr' for 'den elften September.' A case is on record, quoted by Bastian,[2] of an aphasic patient who "perfectly recollected the initial letter of every substantive or proper name for which he had occasion in conversation, though he could not recall to his memory the word itself." "He never was at a loss for the initial of the word he wished to employ." There are cases also of aphasic patients who always exchange certain letters of words in pronounc-

[1] W. Preyer, Zur Psychologie des Schreibens, 1895, pp. 211–212.

[2] Brain as an Organ of Mind, p. 622.

ing them; thus, endeavoring to say the word 'flute,' one said 'tufle,' 'puc' for 'cup,' 'gum' for 'mug,' etc. Again, there may be an almost invariable substitution of certain letters for others, such as 'z' for 'f' in every word which should contain the latter letter.[1]

TABLE V.

Errors in Type-writing.[2]

Error.	*Correct Form.*	*Remarks.*
dise	side	(s) (d) [Relative position of the keys involved].
willst di du	willst du dich	(u) (i).
consciou states	conscious states	An example of Elision.
woman s	woman who smells	(w) (s).
aspect a	aspect over	Not near.
from o	from some outside suggestion	Not near.
ans	and sentences	(s) (d).
my chair q	my chair squeaks	(q) (s).
of selection	of selecting hybrids	Not near.
Professor's	Professor Baldwin's	Anticipation.
ot	of that	(t) (f).
But is	But if this is true	(s) ( ) (f).
sen	second	Not near.
habil	habitual	Not near.
c	occur	Not near.
c	economy	Not near.
or nal	or analogous	Not near.
ul	unlike elements	Not near.
ff	feeling	Reduplication.
cognition stand in inverse ration	cognition stand in inverse ratio	Persistence.
not be	not by reference to	Not near.
morot	motor	(r) (t).
detaisl	details	Not near.
pronouncing ponderous syllables	pronouncing ponderous polysyllables	Elipsis.
fidd	difficult	(d) (f)
Philadelphis	Philadelphia	(a) (s)

[1] Cf. Bastian, Brain as an Organ of Mind, p. 639.

[2] A large proportion of such errors are due to inaccuracy in striking the keys, *e. g.*, when two keys that have to be struck in close succession are near one another (see under Remarks). Otherwise the errors differ in no important feature from other graphic errors. These errors were all made on the key-board of a Smith-Premier and are samples merely.

strans so strengthened	strand so strengthened.....(s) (d)
the c	the important component..Not near.
stt	setting .....(e) ( ) (t)
compen	components .....Not near.
a a a	*a b c* .... { Had in mind the idea of underscoring them all alike.
sttod	stood.....Not near.
cu	accustom.....Not near.
neceaas	necessarily.....(a) (s)
come to come	come to some..... { (s) (c)
himlse f	himself alive.....Not near.

Errors are further classified according as they are verbal or literal. A verbal error is one in which an entire word is concerned. For example, a person said 'Play down' for "Sit down and play me a tune." All parts of words which are also used separately are included under verbal errors. Of course the greater number of verbal errors are oral, and the greater number of these occur in the case of monosyllabic words. As will be seen later, the length of the word is not the only or chief determining condition of the lapse. Rather it is the relation of the word to its 'setting' or context.[1] Literal errors are such as involve alterations or substitutions of letters or unmeaning word-parts only. For example, a person instead of saying 'identity and difference,' said 'idefference.' Another person spoke of the 'ox and the ax' instead of the 'ox and the ass.' Graphic errors are very largely literal; *e. g.*, 'very soof' for 'very soon after,' 'rex' for 'reflex,' 'wright' for 'right and wrong.' A consonant, in the case of oral errors, is regarded as a letter of the alphabet which can not be produced orally except with a vowel. It is but a mouth-form, a muscular attitude, giving 'shape,' 'size' or 'color' to a vowel-sound, thus using to some extent a different musculature from that used in the production of the vowel-sounds, but by themselves having no vocal value. Consonants are not tones but simply breath obstructions. A consonant, in the case of the graphic errors, is a letter of the alphabet graphically produced, which represents such a mouth-form or muscular attitude. The equivalent of a consonant (*e. g.*, kn, wn, gr, pl, st, sm, sn, etc., etc.) is treated here also as a consonant. A vowel, in

[1] Cf. also, on this point, Pillsbury (as quoted below), p. 342.

the case of oral errors, is a sound or tone produced by the vibration of the vocal cords through the aid of the musculature of the larynx, etc. The duplication of single vowels and the combination of vowels in diphthongs are also classified here. A vowel, in the case of graphic errors, is a letter of the alphabet, graphically produced, which represents such a sound. Obviously the above conception of the real nature of a consonant puts the oral errors, in respect of the distinction between the language units, on a different basis from that of the graphic errors, where a consonant differs in no important respect, psychologically, from a vowel.

Here arises the whole problem of the interpretation of lapses in relation to the racial evolution and individual development of language, and in connection with this the problem of the psychogenesis of meaning. This is a problem in genetic psychology which, being too large for consideration here, the writer hopes to develop later as a separate 'Study.' The general method employed promises to be that which Charcot first made popular, the contrasting and comparing of the acquisition of language with the phenomena of its dissociation in disease. This suggests that the fruitful study of the psychology of language (and through this the psychology of meaning) will begin with the pathogenesis of aphasia. The genetic principle maintains that the language processes will 'fall down' or disintegrate in the reverse order in which they were 'built up' or developed. This general principle has been applied with success to the study of memory, where it is found that substantives are forgotten more quickly than verbs and adjectives, and proper names more quickly than common, and concrete terms more quickly than abstract. So, also, in the cases of lapses, other things being equal, those combinations of letters which are least firmly grounded in the organic memory will be the ones first to be involved in error. From such a standpoint it should be possible to work out in serial order the language components of ordinary speech and writing, and by a comparison with the results of philological study to get some light on the racial and individual growth of language. Certainly it is significant that it is the consonantal digraphs which the child learns the last,

that are the most often involved in the phenomena of lapses, *e. g.*, sp, fl, bl, br, st, sm, qu, etc., etc.; that it is the consonants related in origin (so regarded, at least, by modern philologists) that tend to coalesce, *e. g.*, dentals with dentals, labials with labials, etc., and that it is the variable and derivative vocables that chiefly are involved in the errors. In some cases there was a strong tendency to spell words phonetically, or to relapse to the orthographic instincts of childhood, even in the case of words the correct spelling of which was perfectly well known to the subject. Thus 'survival' was spelled 'servival,' and 'receptacle' was spelled 'resceptacle,' 'urgent' was spelled 'ergent,' etc. A determination of the letters which are visually the most easily confused with one another has been worked out by Professor Sanford, and his generalization is that "reproduction is very nearly a function of the ease with which we distinguish the various letters." Pillsbury has shown the relation of defective letters or mutilated letters (incomplete, blurred or absent) to the tendency to 'lapse,' and finds that such defects are most influential when they occur in the earlier part of the word, syllable or sentence.[1] This is a rich field, and much is expected from further investigation.

III. The Artificial Production and the Tabulation of Errors.

Method of Producing Errors.—The attempt was made to supplement the class of data collated from ordinary experience by some of an experimental nature. The experiments were made with ordinary language forms and modes. Experimentation with numbers and with nonsense syllables affords similar problems; but they do not present so common, and therefore characteristic, phenomena as are found in the types of experience used below. Nonsense syllables were used, but did not yield results in any important respect different from those obtained by the other methods.

The specific *problems* took the following form:

(1) In general, to multiply data from which generalizations might be made. This is in great part successful, but the kinds

[1] *Am. Jour. Psychol.*, VIII., p. 347. Cf. also what he says on the influence of the 'high' and 'low' letters.

of errors are in certain ways limited. For example, there are produced almost no errors of the sort catalogued below as exchanges (cf. Tables XXIX. and XXX.), while errors classified below as Repetitions are very abundant (see Table below).

(2) To get a general statement of the normal scope of anticipatory and so-called retrospective attention in reading and speaking, copying and writing (composing), in different classes of subjects and in different degrees of familiarity with the subject-matter by an examination of the lapses produced under varying conditions. To do this it was necessary to produce errors under differing conditions, and then from an examination of those errors to get a general statement of the psychological unit in the terms of lapses, that is, to determine the unit of which the sentence or word is ordinarily constructed in speaking and writing (whether it is a letter, a part of a letter, a word, word-part, or phrase), and to determine whether such psychological unit follows the meaning of the sentence and how it is dependent on the purely formal or grammatical conditions.[1]

(3) To study the conditions for the consentient memory of spoken and written words, that is, the relations of the different factors, kinæsthetic, visual and auditory, in the concrete verbal consciousness; this to be done by an analysis of what is involved in different types of lapses. The chief reliance was necessarily upon introspective evidence. This intended to be, as it only can be, corroboratory of already well-recognized principles.

(4) Finally, to analyze into its functional elements the ordinary complex stream of speech and writing consciousness in order to determine the laws of verbal assimilation in the terms of lapses; in particular, to study the conditions under which are produced the various types of coalescence classified below as persistence, anticipation, ellipsis, transposition, substitution, exchange, etc. Here, again, the attempt is made to interpret these new data of lapses in terms of the already existing and well-recognized categories of association, assimilation and coalescence.

The following *methods* were employed:

[1] The methods employed and the results secured are taken up more fully below in the discussion of the psychological unit.

(1) For the visual-vocal method, a screen with an opening or slot capable of instantaneous closure. By visual-vocal experiments are meant those in which the stimulation is visual and the expression vocal. The subject reads either to himself or, better, aloud (thus introducing the operator's hearing as a check). In the latter case the subject need not know the object of the experiment. The subject is seated with eyes fixed on a legend so arranged as to be instantaneously covered by a drop shutter. He is asked to read aloud at a normal rate, the shutter being dropped at various points in the sentence. Artfully arranged words, sentences, etc., are used to vary the experiment. The subject is asked immediately upon the dropping of the shutter to continue the sentence or words as far as possible. Unexpected juxtapositions of thought are used to see how far the completion is due to mere association. By various combinations of letters and words it is discovered how far peculiar visual impressions serve to catch the anticipatory attention. This experiment is made with separately printed legends or with the last three or four lines on the page or in the paragraph, and the shutter is dropped just as the reader pronounces the second word in the last line. In this way the disturbing and otherwise uncontrollable influence of the next succeeding lines is excluded.[1] Visual-vocal experiments may be with (*a*) familiar or (*b*) unfamiliar subject-matter. The 'Psalms,' for example, were used for the familiar and Browning's 'The Ring and the Book' for the unfamiliar. Again, they may be made with (relatively) (*a*) undivided or (*b*) divided attention, the diversion in the latter case being through either the same sense or through a different sense. For example, experiments may be varied by introducing some other interest or diversion for the subject, such as requiring the subject to continue reading or writing in the midst of a diverting noise or while listening to the reading of a fascinating story, etc.

(2) For the auditory-vocal method cacophonous juxtapositions and alliterative combinations of letters or words were dictated and required to be repeated from memory. Greater difficulties present themselves here than in the visual-vocal method,

[1] For the disturbing effects of contextual forms in reading see Table VI.

because of the interference of the element of time and the distinctive memory factor. It is doubtful in all forms of the auditory-vocal experiment where no great time has elapsed between the hearing of the dictate and its attempted repetition, how far we are dealing with memory proper, how far we are really controlling the experiment. In addition to the above, the following experiment was made: The subject repeated a familiar snatch of prose or rhyme while silently reading an interesting tale, thus deliberately introducing the memory factor.

(3) Two methods may be employed in experiment with the auditory-manual type of errors. Either a list of familiar or unfamiliar and meaning or unmeaning letters or words are dictated in the ordinary manner, gradually increasing the speed, or some disturbing factor is introduced from without. The latter form of the experiment was varied in several ways: (*a*) dictation took the ordinary form except that interjaculatory remarks were suddenly introduced, irrelevant questions asked, etc.; (*b*) the subject was compelled to write with his eyes closed; (*c*) the subject was compelled to write with his eyes closed and his ears stopped up so that he could not hear the sound of his own writing, but still could hear the dictate.

(4) In the visual-manual method the subject wrote (copied) under the following conditions: (*a*) in the ordinary manner, with increasing rapidity, (*b*) while repeating some familiar series of letters, numbers, or words, or some set phrase, (*c*) while the operator read to him, (*d*) with eyes closed and with ears stopped with cotton, so as to exclude both eye and ear control, (*e*) while dictating alternately to another amanuensis.

Table VI.

Errors due to Letters, Word-parts, or Words in Adjacent Lines.[1]

Error.	*Correct Form.*	*Remarks.*
fifth door	fifth floor at the door	'door' next line below
fench	hedge	'fence' " " "
Mr. Geoffrey's incident	Mr. Geoffrey's injury	'accident' " "
I concleech	I conclude	'speech' " "
Over the brummer sea	Over the summer sea	'the briny deep' "
Giovanni smoled	Giovanni smiled	'over' next line "
flacked	flocked	'valiant' " "

[1] Except where otherwise indicated, these were all in reading aloud.

whom I	whom to have seen	The following three lines began with 'I.'
we might not infer	we might not interfere	'infer' just below in next line.
The sun rose in the same length	The sun rose in the same place	'length' next line below.
sheep	speech	'sheep' " "
Instantly the thrightened man	Instantly the frightened man siezed the threatening antlers	The word 'threatening' just below in the next line.
this is in prophecy	this is in parenthesis	A graphic error in copying: the word 'prophecy' was in the next line below.
These al	These illusions	Graphic: 'assimilative' next line below

TABLE VII.

ERRORS IN REPEATING CACOPHONUS AND ALLITERATIVE COMBINATIONS.[1]

Cacophonous Juxtapositions

Big bug's black blood	Bax kiz fob dap lom bax	She sells sea shells
. . blug's	. . fiz	. . . . she
Bigs bugs	. . . . fab	sea
Big bigs	. . . . . lap	. . . . . sells
. . . . . bug	. . . . . lap dom	. . shell sea shell
. . back	. . . . . lop	. . shells
. . bug bug bug	. . . . foz dab	sea sells
. . blug blug	. . . . fab dop	sea sells sea sells
. . blood's	. . . . . lam box	. . shells she shells
. . . . . bood	. . . . . box	

Grief that gazes at a grave	Round the rugged rock the ragged rascal ran
. . . . . grazes	. . . . . rags
. . . . . grazes at a gave	. . . . . rascal
. . . . . grazes at a grave	. . . . . rugge rocks
gief	. . . . . rugged
. . . . . gave	. . . . . ragged rack
gries	
gies	

Alliterative Combinations.

Pyle's Pearline Possesses Peculiar Purifying Powers		Propagable
. . . . . Peculiar		Procagable
. . . . . Pepurifying		Procabable
. . . . . Pessesses		Propabable
. . . Possesses		Propable
Pyers		Propagagable

Compound complex comminuted fracture of the olecranon process

. . . . . olequenon
. . . . . communuted
. . . . . plocess
. . . . . clomplex

[1] These are simply samples selected from a large list of similar errors.

The following *results* were obtained :[1]

(1) In the use of the visual-vocal method, the results have been grouped as follows: (*a*) The subject completing the line, his vision being cut off as he is speaking the second word. Wundt's 'Outlines of Psychology,' and Hodgson's 'Metaphysic of Experience' were used for the experiment, also cacophonous and alliterative combinations. In both cases there was a consciousness of selecting letters and word-parts and piecing them together, forming hybrids, but 'it seemed to do itself.' In the case of cacophonous alliterative combinations, a general break-down is noticeable as compared with ordinary English prose. The little (short) words are left out. The whole thing is very fragmentary. The combinations selected by the subject make less sense. A big or an unfamiliar word 'spreads itself over everything else.' The portion clearly seen and retained by the subject varies from a single word or part of a word, in the case of the less familiar or the unmeaning, to nearly the whole line, when the passage is more familiar or makes more sense. (*b*) The subject glancing (for about one second) at the line and reporting what is seen clearly. The same material was used as in the experiment just preceding this. The results are sufficiently apparent in the tabulations. (*c*) The subject filling in blank spaces in ordinary English text, where words have been erased. Commented on below. (*d*) The subject reading an interesting story, the operator noting the errors due to emotional changes. Commented on below.

(2) In the auditory-vocal method errors were noted in the repetition by the subject of cacophonous and alliterative combinations.[2]

(3) In the auditory-manual method five types of experimentation were used. (*a*) Dictation to the subject with increasing rapidity, his eyes open. Some subjects constantly multiply strokes (sometimes several times in succession), letters, and even words; but get all the dictate, and learn with practice not to multiply letters so much (the subject in one instance

[1] General statements only are here made : for detailed results, see tabulations and treatment below.

[2] See Table VII., for results in a brief form.

looked over the material with the operator in each case immediately after the completion of the experiment). Other subjects drop letters and whole passages, that is, do not get all the dictate. The influence of both persistent and anticipated forms is very marked, of course, in all alliterative dictate. (*b*) Dictation with subject's eyes shut and ears stopped so that he could hear the dictate plainly, but could not hear the sound of his own pencil. This was about the same as the following experiment as to results. (*c*) Dictation with subject's eyes shut, subject repeating phrase. Here persistence of entire words is frequent. The results found in (*a*) are exaggerated. (*d*) Dictation of English words backwards, letter by letter, subject's eyes shut. Errors involved letters only. T's not crossed and i's not dotted. (*e*) Operator and subject dictating to each other. Ellipsis and persistence of entire words and phrases. Great disturbance.

(4) In the visual-manual method also five types of experimentation were used. (*a*) Subject copying (or writing from memory) a familiar word or phrase as rapidly as possible. Tendency to repetition in some subjects; tendency to ellipsis in others. Tendency to function but once for all alliterative letters, or else rhythm takes it up and we have reduplication of the alliterated letter. (*b*) Subject copying, with eyes shielded from his own manuscript, and repeating a phrase. Fewer mistakes in copying foreign (unfamiliar) language and unmeaning subject-matter; but the subject went forward much more slowly and wrote with greater effort, fatiguing sooner. Repetition of letters and words from copy and substitutions and insertions from the repeated phrase (echolalia) were noticeable in certain subjects, while ellipsis of letters and words from copy and substitutions and insertions from repeated phrase were noticeable in other subjects. Coalescences were numerous and striking. (*c*) Subject copying while operator read to him. Same as preceding. (*d*) Subject copying, eyes closed and ears stopped up. Some subjects much confused. Others not. (*e*) Subject copying while dictating alternately to another amanuensis. Very disturbing.

Tabulation of Errors.—Typical errors have been thrown

together into separate tables according as they illustrate different principles as discussed. These tables consist of the following:

I. List of Cacophonous Juxtapositions in the Pronunciation or Writing of which Errors were Made.

II. Coalescence due to the Conflict of Two Peripherally Excited Ideas.

III. Coalescence due to the Conflict of a Centrally, with a Peripherally Excited Idea.

IV. Coalescence due to the Conflict of Two Centrally Excited Ideas.

V. Errors in Type-writing.

VI. Errors due to Letters, Word-parts, or Words in Adjacent Lines.

VII. Errors in Repeating Cacophonous and Alliterative Combinations.

VIII. List of Errors Occurring in 'Internal Speech,' or 'Mental Pronunciation.'

IX. Errors in Writing due to the Influence of Auditory Imagery.

X. List of Errors showing Tendency to form Familiar Words, or Word-parts.

XI. List of Oral Errors due to Similarity in Sound of Adjacent Letters, Word-parts, or Words.

XII. List of Graphic Errors due to Similarity in Appearance in Adjacent Letters, Word-parts, or Words.

XIII. Examples of Repetition in Experimental[1] Graphic Errors.

XIV. Examples of Errors due at once to Persistence and to Anticipation.

XV. Ellipsis due to the Sense of having written the Letter, Word-part, or Word.

XVI. Ellipsis due to Previous Pronunciation of the same Letter, Word-part, or Word.

XVII. Graphic Ellipsis due to the Anticipation of Letters, Word-parts, or Words.

[1] Experimental errors are used in the Tables only when in some way adding to the significance or variety of the data collated from ordinary experience. A larger use of the experimental material will be made in the genetic study alluded to above.

XVIII. Oral Ellipsis Due to Anticipation of Letters, Word-parts, or Words.

XIX. Examples of Graphic Persistent Transposition.

XX. Examples of Oral Persistent Transposition.

XXI. Examples of Graphic Anticipatory Transposition.

XXII. Examples of Oral Anticipatory Transposition.

XXIII. Graphic Persistent Substitutions.

XXIV. Oral Persistent Substitutions.

XXV. Graphic Anticipatory Substitutions.

XXVI. Oral Anticipatory Substitutions.

XXVII. Graphic Examples of Coalescence which involves the Modification of a Vowel or Consonant.

XXVIII. Oral Examples of Coalescence which involves the Modification of a Vowel or Consonant.

XXIX. Examples of Graphic Exchange.

XXX. Examples of Oral Exchange.

XXXI. List of Ludicrous Lapses.

IV. Lapses as a Study in Association.

General Nature of Assimilation.—The most prominent feature of the lapse is the aspect which it presents as an instance of what is rather loosely called mental association or association of ideas. Lapses we have seen to be products of involuntary attention or subliminal association, what G. F. Stout calls anoetic or subconscious mental life. They are, of course, influenced indirectly by voluntary attention and by habit; but they are products essentially of the associative (relatively passive) rather than of the apperceptive process (which relatively is active). The process involved is best described by the term assimilation, as used by the English analytic psychologists.[1] Assimilation is defined by these writers as that anoetic mental process in which presentations (or percepts) and images (or ideas) are fused, or coalesce. It is thus the handmaid to association, and analogous to attention and apperception in noetic consciousness. We have in the realm of unexpressed thought the coalition of part of a new idea with an old one by substitution or modification. A new element is assimilated to the old

[1] Cf. G. F. Stout, Analytic Psychology, II., p. 118 f.

content by exciting the motor associations of that content. This process Herbart called apperception, but it is now more commonly called assimilation, at least in so far as it takes place in the so-called subconscious type of association. It is indifferent for this discussion whether assimilation ultimately be interpreted in terms of association as used by the English psychologists, or in terms of apperception as developed, for example, by Wundt under the influence of German idealism. The category of association is here employed simply because phenomena analogous to lapses have hitherto been chiefly studied under this category. In the present use of the term it may be said, to employ a figure first used by Ward, that assimilation is related to association in the narrower use of the term, somewhat as, politically, an amalgamation or union differs from an association or confederation—that is, it is specific and more intimate. This process of assimilation may or may not, in the case of lapses, find expression in audible speech or in visible character. The rule is that it does, but, as has already been seen in the case of mental pronunciation, this is not an essential feature.

Lapses have been roughly classified into two main groups, according as they are sensorimotor, *i. e.*, peripherally excited, and ideomotor, *i. e.*, centrally excited. But since, relevant to the present investigation, reproduction or memory may be regarded as simply a relatively permanent or prolonged after-sensation, we may in discussing these errors as phenomena of mental association, treat them as in this respect all upon the same basis. That is, the centrally excited or ideomotor errors are no more associative material than are the peripherally excited or sensorimotor. The assimilative process takes place in both cases for the most part beneath the threshold and so far as we can determine in an identical manner. This is what occurs in all cases of what Titchener has called 'associative supplementing,'[1] such as auditory localization, judgments of distance by size and of size by distance, etc., which is little more than a technical way of referring to the commonly observed fact that ideas or objects (we are not here concerned to distinguish them)

[1] An Outline of Psychology, p. 194.

are not isolated and separated from each other, but are related, that is, have a context. The simplest experience (in the adult at least) has a 'setting' or 'background.' This 'setting' may be entirely disregarded for the time being, yet its influence is indubitable, since if absent or removed the effect is marked at once in the attentive consciousness. That these ultimate constructive elements of our ideas of objects are really lurking in the margin of consciousness, comes out clearly when through some 'hitch' in the thought, these ideas find only partial or defective expression. They are what Pillsbury has called 'dark ideas,' which require certain conditions for clear recognition, yet whose presence is felt by their general influence on the net result in consciousness. Pillsbury gives the following instance and explanation of this. "If, for example, I read 'shocolate' as 'chocolate,' I get first an association of identity between the last letters of the word given and the corresponding letters of the word-idea 'chocolate,' and these, by contiguity, give the 'c' immediately and simultaneously."[1] The general purpose of Pillsbury's investigation was "to determine the amount of change which might be made in an object ordinarily perceived or assimilated in a certain way without change in the character of the resultant perception or assimilation." The result was to show that considerable alteration could be made without being detected in the ordinary process of reading the word. We shall refer to these researches again. Münsterberg has found "that if a word is displayed for a brief time, which presents some slight difference from another word, it is read as though this difference were not visible, provided that a word is previously called out to the observer which stands in intimate association to the other, but has nothing to do with the actual impression. Thus 'part' is read 'past' if 'future' is suggested; 'fright' as 'fruit' if 'vegetable' is given."[2] Carpenter went so far as to maintain that the ordinary process of expressing thought in spoken or written language is for the most part of the nature of a cerebral reflex (he calls it an 'ideo-motor' process). He says, "The attention may be so completely given up to the choice of words and to the composition of the sentences, that the move-

[1] *Am. Jour. Psychol.*, VIII., p. 333.

[2] So stated by Külpe, Outlines of Psychology, p. 183.

ments by which the words and sentences already conceived are uttered by the voice or traced on paper, no more partake of the truly volitional character than do those of our limbs when we walk through the streets in a state of abstraction."[1] A very fruitful field for the observation of the effects of such assimilation is what we have referred to above as sense-illusions. The tendency is very strong to make something with a meaning out of the fragmentary percepts that are actually grasped.[2]

With this statement of the general nature of what we mean by assimilation, we turn to the specific phases which it presents in connection with the study of lapses. We will take up these under the following heads: (1) the light which lapses throw on the nature of the psychological unit in verbal assimilation, (2) the factors of verbal assimilation as brought out by this study of lapses, (3) the laws of verbal assimilation from the standpoint of lapses, and (4) conflict and coalescence.

The Psychological Unit and its Statement in the Terms of Lapses.

The human consciousness in distinction from the consciousness of the lower animals might fairly be characterized as the speech consciousness. In human life speech is *par excellence* the function of expression and the medium of education or progress in intelligence. But this speech arises like everything else, not only in the race evolution, but in individual development, out of chaotic beginnings which, comparatively, are what we call unintelligent, irrational, meaningless. "Articulated sound when informed and interpreted by thought," says Bowne, "becomes rational speech; but in and by itself it is only noise."[3] One characteristic of the language of the educated human being, as contrasted with the mere unmeaning noises of inanimate objects and the imperfectly symbolic noises produced by the lower animals, is its aspect as the unification or integration of certain objective symbols of physical expressions into units of meaning, what we have here called psycho-

[1] Mental Physiology, Section 236, p. 280.
[2] Cf. Table XXIV., and the discussion below.
[3] Theory of Thought and Knowledge, p. 47.

logical or mental units. Collins calls attention to the fact that in our language as it stands, ciphers and figures have a much more definite and constant value as symbols than letters and words (thus facilitating the work of arithmetical prodigies).[1] This is probably because the figure like the verb in language represents a condensed judgment. An adequate study of the psychology of meaning we have already said must be genetic and primarily observational, and only in a secondary way and for the purposes of verification, analytic and experimental. Much is to be expected from further researches on the kinæsthetic sensations, muscular memory, etc., but even more from the scientific study of childhood and from anthropology. This genetic study is not undertaken here. But certain facts relevant to the psychological conception of that problem are suggested by a study of lapses, and to these facts attention is here called. To get the psychological unit in the sense of a mathematical statement or psychometric formula is impossible, since it is of the very nature of meaning that it should vary with each shift of the environing conditions, and any relative 'fixing' of the conditions means to that extent the 'fixing' of the meaning. Hence the complete control of the conditions would mean an absolutely static meaning, and thus no phenomena with which to experiment. The only recourse is to what has aptly been called 'Nature's experiments,' pathological phenomena (such even as we have here in lapses), and the phenomena of ordinary experience. Consequently, the most that can be undertaken is the determination of the nature of a unit of meaning in some functional statement of its relation to the rest of experience, especially in the light of the ways in which the expression of such meaning breaks up under the conditions which produce what we have called ellipsis, transposition, substitution, exchange, etc. From this point of view two generalizations may be made: (1) that the psychological unit may vary (according to the context) from a single letter (or even part of a letter) or word, to a whole clause, sentence, or even paragraph; and (2) that the psychological unit ultimately is to be stated in terms of the activity-experience (in terms of kinæsthetic sensations, using that word in a broad sense).

[1] Faculty of Speech, etc., p. 63.

It has for years been held, largely on theoretical grounds, that the psychological unit in reading and speaking may be the entire word or even the sentence, as well as the letter or syllable. In modern logical theory the mere proposition does not become a judgment until the words are grasped, not merely as separate units, but as entering into each other, modifying each other, and thus becoming parts in an ideal whole of meaning. This truth is often expressed, says Bosanquet, by saying that the sentence is the unit of language, *i. e.*, "a word taken by itself cannot have a complete meaning—unless it is a verb, or used with verbal force, for a verb is an unanalyzed sentence."[1] That words may be single presentations as well as single letters seems probable from the fact that the child learns and uses many names of things, and is capable of using them discriminatingly, long before he can spell them. Moreover, it has been found by experimentation that "a familiar word of four letters can be apprehended by the attention as if it were a single letter; it is attended to not as a series of letters, but as one total impression."[2] Reaction experiments by Cattell and others show that the word as a whole may be the unit, and that the separate letters often require as much time for recognition as short words. In paraphasia the patient often loses his speech not by single letters, but whole groups of words drop out, what Stout (after Herbart) would call entire apperceptive systems. Nouns and adjectives are the classes of words which are the first to disappear, often together. Pedagogy is only beginning to learn a useful lesson from such facts. It is significant that the aphasic convalescent who relearns to read, does so in the reverse order to that by which most of us learned to read. He begins, not first with the letter as made up of such and such strokes, then with the syllable, and finally the word and phrase or sentence, but he begins "by first getting the perspective of the word, the outline, then the syllables that constitute the word, and, last of all, the letters."[3] Says Onuf, concerning certain aphasic patients,[4]

[1] Essentials of Logic, pp. 82–85. Cf. also p. 86, where he says, "There are traces in language that indicate the sentence to have been historically prior to the word."

[2] Titchener, An Outline of Psychology, p. 146.

[3] Collins, Faculty of Speech, etc., p. 132.

[4] *Jour. Nerv. and Ment. Diseases*, Mch., 1897, p. 147–148.

"Entire words were read more promptly than letters composing them. Words which were read correctly were spelled wrongly. The patient often spelled *a posteriori* from the sound of the word (*e. g.*, 'one' read correctly but spelled 'won' and 'unknown' read correctly but spelled 'unwnown'." He says further, "In arriving at their conclusion that reading always occurs by spelling, Wernicke and Grashey evidently did not consider the peculiarities of the various languages, especially the English. The varying enunciation of the same combination of consonants, or of vowels, or of both, make it impossible to read English only spellingwise. It is enough to call to mind the three-fold enunciation of 'ow,' and the three-fold manner of writing the sound 'n' (n, kn, wn). It may further be mentioned that a new method of teaching is now in use in many schools, by which the children are taught to read words before learning the single letters. This method seems indeed more rational, as the visual word memories become thus directly associated with the formerly acquired sound memories and psychomotor images of the words. But even if reading was learned purely spellingwise, one would learn to read as a whole those words which occur frequently. Many persons will read a language correctly and with great fluency and yet make numerous orthographical mistakes in writing, for the reason that certain combinations of letters are read as a whole and only the sound of them is remembered. 'Enough' may be written 'enuff,' and 'though' as 'thow.' He who has learned a new language by grammar is less apt to make orthographical mistakes in writing than he who has learned it directly from hearing; yet the latter may eventually read it much better than the former."

A study of lapses confirms the above theory. The fact that so many complete exchanges[1] are made and yet the sentence felt to be correctly expressed, the error not being noticed (that is, the meaning or symbolism of the words, taken as a unit, not being affected), shows that the psychological unit, in reading and speaking at least,[2] may include several words. By going

[1] See Tables XXIX. and XXX.

[2] Few exchanges occur in writing.

through the tabulation and taking clear cases of exchange it would thus be possible to work out in a rough way the span for the speech and reading consciousness, by noting the extreme limits in the sentence where words are involved in error. This would be to measure how far ahead letters or words would be anticipated or persist—and mutually coalesce. These may be taken as the nuclei or nodal points in the sentence which embrace between them the units into which the sentence becomes disordinated under any of the conditions mentioned in a former part of this study. Such an attempt reveals the fact, however, that most of the words which constitute the language used by adults are made up of several component presentation elements or assimilative factors varying with diverse conditions. These conditions remain to be worked out in detail by a genetic study of the psychogenesis of the unit of meaning. We know that in general the earliest acquisitions in childhood are dependent upon such conditions as (what for want of better terms are called) verbal adhesiveness, alliteration, rhythm, euphony, onomatopœia, cadence, accent, etc.

These language elements, whatever they be, which become involved immediately in the lapse are here called the coalescent forms, or simply coalescents. Whether these are to be regarded always as identical with the psychological or meaning units seems to depend upon laws lying deeper than any that have been unearthed by the mere analytic approach to the problem; the rule is, however, that the errors follow the meaning rather than the mere grammatical form. The important point emphasized in this connection, and clearly brought out by the study of the errors tabulated, is the fact that among these language symbols which we call letters and words there are certain ones which seem to stand for the rest. It is a familiar matter of observation that it is not necessary to hear all the words (with the tones and modulations of vowels and consonants) in a spoken sentence, nor to see absolutely all the characters (flourishes, punctuation, dots of 'i's', crosses of 't's,' etc.) in a written sentence, to get the meaning.[1] Says Wundt,[2] "The hearing of words is

[1] Cf. Stricker, Sprachvorstellungen, p. 63.
[2] Outlines of Psychology, p. 228–229.

continually accompanied by assimilations; the sound-impression is incomplete, but it is entirely filled out by earlier impressions, so that we do not notice the incompleteness. So it comes that not the correct hearing of words, but the *misunderstanding* of them, that is, the erroneous filling out of incomplete expressions through incorrect assimilations, is what generally leads us to notice the process. We may find an expression of the same fact in the ease with which any sound whatever, as, for example, the cry of an animal, the noise of water, wind, machinery, etc., can be made to sound like words almost at will." So with the common experience of the 'right hearing of words wrongly spelled.' "Even a practiced proof-reader," as Titchener says, "may overlook mistakes in very familiar words. On the other hand, the misprints in a book which is written in a language not so familiar to us as our own attract our attention at once. We read English by general impression, supplementing what we see as we glance quickly over the printed words; we read German or French more accurately, because more slowly and toilsomely."[1] These elements which we do get are the verbal schemata which, in normal and correct expression, are filled out in full by the entire number of letters and syllables. That these schemata are thus filled out is amply brought out by Pillsbury's experiments and by such cases as the following visual illusions, which have been collated by the writer: 'Causality' was read 'casuality,' 'calvary' 'cavalry,' 'conversation' 'conservation,' 'density' 'destiny,' 'through' 'though,' 'perceptual' 'perpetual,' 'Atlantic' 'Analytic,' 'forfeited' 'fortified,' 'anatomic' 'automatic,' 'unite' 'untie,' 'spilt' 'split."[2] "The art of reading," says James, "is the art of skipping; that is why an author is usually the poorest proofreader of his own productions, since he is most apt, by association, to supply the missing characters."[3] When in reading, one comes repeatedly upon such a connective as 'and,' say, between two proper names, as 'Jack and Jill,' or 'Philadelphia and New York,' one does not every time have to spell it out, *a-n-d*. Again, in other expressions such as 'San Francisco, California,' one often gets the word

[1] An Outline of Psychology, p. 196.
[2] Cf. also James, Psychology, I., p. 264–265.
[3] Psychology, II., p. 369.

from the context so forcibly as to require the seeing of no more than a letter or two in its usual relations to get the whole. Bain says, we frequently recall entire sentences 'by hitting on catch-words.' "The single word 'phrenzy' uttered with emphasis will recall, in a mind familiar with the passage, 'The poet's eye in a fine phrenzy rolling'; the principal epithet in such a case being enough to reinstate the entire connected train." So 'Duty' may call up Nelson or the Duke of Wellington.[1] The recall of names by things and of things by names furnishes illustrations of cases in which the word-idea is divorced from the meaning-idea; the physical symbols become floated off, so to speak, from their natural 'mental' relations. In proof-reading we get the pure word ideas as the successive foci of consciousness in a way which is not true of the ordinary process of reading to get the sense. These pure word-ideas in such cases are the schemata of which we were just speaking. Still further illustrations of such schemata are found in the use of grammalogues in short-hand writing, where the purely arbitrary symbol stands for a more or less complex meaning-idea.[2]

Lapses throw light on the nature of these schemata. A reference to the tabulation will show the coalescent forms to be largely consonants and consonantal digraphs, and, as we saw above, derivative rather than fundamental language forms. As we shall see later, also, contiguous substantives tend to coalesce when they contain wholly or partially identical meaning elements. On the other hand, contiguous connectives tend to coalesce when they stand in identical or analagous relations to adjacent substantives. A given word or sentence has a certain meaning, and it is indifferent, within certain limits,[3] what subsidiary elements go to make it up, or whence they come, so long as the significant or fundamental elements (the ribs of the skeleton of the word, so to speak) are intact. If the meaning attaches, not to the word, but to the phrase, then you will get such a lapse as 'Phosfor d's Acid Horsephate' or 'Put the trays on the weights' (exchanges). If the mean-

[1] Senses and Intellect, third ed., 1868, p. 469.

[2] Cf. also Bosanquet, Logic I., p 74.

[3] The problem as to just what are these limits remains to be solved. Sanford and Pillsbury have done something on the experimental side.

ing attaches to the word, then the error will rarely go further than to take the form of a substitution, while under still more restrictive conditions we get simply the transposition or ellipsis. In the graphic errors we notice the relative paucity of the former, and the relative abundance of the latter types of error, just because here the word-parts, syllables, letters, etc., constitute important immediate factors in the meaning.

A corroborative statement for the above observations on the psychological unit in reading and writing was sought by the writer in other ways. (1) The subject was required to read aloud from the printed page and at the same time write some familiar phrase or write dictated material. This proved to be at first very difficult. It was varied by using (*a*) combinations of words making sense, and (*b*) unmeaning combinations of words. The manner in which the unit was isolated in this experiment was for the operator to note down the snatches of the text read aloud between the spasmodic spurts of writing, or the passages written in the intervals between the attacks upon the reading. The ability to utilize words in this experiment holds about the same for words of different lengths in the case of the combinations of words which made sense. That is, two long words will be read or written about as readily in one pulse of attention as two short words. But in the case of the unmeaning combinations of words not only is the span of the reading and writing consciousness greatly abbreviated, but it is also very variable, due, no doubt, to the irregular and inconstant degree of possibility of making sense out of the nonsense combinations. In other words, this confirms the general view derived from a study of lapses, that the span or unit of the reading or writing consciousness varies with the meaning of the phrase or clause, not with its absolute length. Any person accustomed to copying on a typewriter knows how much easier it is to remember a passage which makes some sense or is complete in itself as to meaning than it is to remember one which at both ends perhaps shows its fragmentary character. (2) Another method employed was that of using paragraphs of text from which here and there words were erased, the subject being required to fill out the blanks with the first word or words that oc-

curred to him. The words which were inserted, as a rule, bore a definite and constant relation to the immediately preceding or following content. That is, if a single word would complete the sense a single word alone would be substituted. If several words were required to complete the sense these would be substituted, if not orally, at least mentally. The single word does not come in except with such a context of meaning as does not require more than a single word to complete the sense. This experiment supports the conclusion that for the reading consciousness the single word is not the unit, but always carries a context with it (usually to the next idealized punctuation mark), it may be a phrase or even a clause, and it may be in definite or in vague, ill defined symbols. A variation of this experiment was that in which incomplete sentences were written and the subject required to complete them. This showed essentially the same results, the portion supplied to complete the sentence varying from a single word to an entire (and sometimes lengthy) clause, and varying from the greatest readiness to the greatest hesitation in response, on the part of the subject. (3) A third method is that in which there was exposed to the subject for a period of time sufficient for a single perusal, a line of reading matter, and the subject asked immediately to tell what he remembered of it, and to indicate what stood out prominently in this memory of the immediate past. The results tend to support the conclusions of A. Binet and V. Henri,[1] who found (*a*) that the words which stand at the beginning and at the end of a series are best retained, but that (*b*) those words whose sense it is more difficult to understand are more easily retained, since they make a greater demand on the attention. That is, here, again, the breaking up, and the reconstruction of the sentence in memory, both follow the meaning.

We have suggested that the word-idea and the meaning-idea are different things. The term 'word-idea' is here employed as Stricker uses it, as "ein leeres, inhaltsloses Wort * * * oder

[1] La Mémoire des mots, L'année psychol., I., pp. 1–23, 1895; reviewed in *Zeitschr. f. Psy. u. Physiol. d. Sinnesorgane*, XII., p. 154–155. Cf. also Pillsbury, *Am. Jour. Psychol.*, VIII., p. 349–350, and Cron. and Kraepelin, *Psychol. Rev.*, March, 1899, p. 230.

eine reine Wortvorstellung."[1] That is, the pure word-idea is the idea of the symbol as a mere symbol apart from its content of meaning. In the ordinary experience of the person who has not given especial attention to the subject the two are not felt as distinct. But when once attention has been directed to the difference they are readily separable. If I understand English only, I may have a pure or mere word-idea corresponding to the visual or auditory image of the German expression 'Schlag,' but I will have an idea of the meaning of this word only if I understand it to mean 'stroke,' or 'beat.' Or if we take an acrostic or an Egyptian hieroglyph the idea of the symbol as a symbol stands apart from its meaning. How the meaning-idea may transcend the word-idea which is the mere linguistic symbol or statement of it, is seen, also, in the fact that often "when people do not know what they mean, they yet mean something of very great importance," or in the observation that "what people demand is seldom what would satisfy them if they got it."[2] The mere word-idea stands for what the word is by and for itself.[3] The meaning-idea stands for what the word is in relation to a context of experiences. The mere word-idea stands for the word as it appears or sounds. The meaning-idea stands for what we can *do* with the word-idea. That is, the pure word-idea is usually in terms simply of visual or auditory imagery. The meaning-idea must be in terms of kinæsthetic imagery (so-called 'motor' imagery). It is true that one's apprehension of a language is not necessarily proportionate to his ability to use it in either speaking or writing. Many persons, for example, can *read* scientific German who can not speak it or understand it when spoken. But this ability to read a language beyond one's ability to speak or write it, is possible only by borrowing, so to speak, the motor imagery from one's native tongue. One literally respeaks or rewrites the foreign language, mentally, in his mother tongue, as he reads it, before he understands it. This is borne out by the fact, noted above,

[1] Sprachvorstellungen, p. 18.

[2] Cf. Bosanquet, The Philosophical Theory of the State, p. 118.

[3] This, of course, is true only within limits, since there must be some recognition of meaning in order to distinguish the symbol as a symbol and this particular symbol from others.

that the errors in the tabulation follow the dynamogenic or kinæsthetic imagery, which is the imagery of meaning, rather than the sheer auditory or visual imagery, which taken alone corresponds to what we have called the pure word-idea. The same thing is brought out in the experiment which James uses to illustrate his discussion of the principle of association, "Partly open your mouth and then imagine any word with labials or dentals in it, such as 'bubble,' 'toddle,' etc," or attempt to "think of one vowel while continuously sounding another."[1] It is found to be very difficult, if not quite impossible. According to Stricker,[2] we learn to speak and write, to combine auditory and visual images into symbols and words, through the mediation of the motor or kinæsthetic ideas which are developed in the actual attempt and operation of speaking and writing. Probably through auditory and visual images alone, without these kinæsthetic images, we should never learn either to speak or to read or to write. Or, to state the same thing in other terms, the meaning-ideas which constitute the content of our verbal associations are ultimately kinæsthetic or motor, not visual or auditory. These kinæsthetic images may be associated more closely with this or with that set of sensory experiences, thus giving rise to the different associative types, 'visuals,' 'audiles,' 'motiles' (other kinæsthetic), etc.; but, as Stricker puts it, there must be a 'Mitwirkung des motorischen Sprachcentrums' for the understanding of the 'meaning' of the purely visual or auditory symbols. Why, it may be asked, are all our sensations concentrated with reference to the visual process (in reading) or with reference to the auditory process (in listening)? Simply, it must be answered, to get an adequate stimulus to enable the tongue or hand to do something which *it is starting to do*. There must be this return wave of the kinæsthetic imagery, to select and organize the visual or auditory perceptions, before these processes are really perceptive, before they have any meaning. If it were not for some other organ or organs implicitly involved (such as the musculatures of speaking or writing), the eye would be as well pleased with a blotch of ink or with a patch of color as

[1] Psychology, II., pp. 63-64.

[2] Cf. Sprachvorstellungen, pp. 26-28, 77-78.

with letters and figures. It is because these other organs (which carry with their functioning the distinctive imagery of 'meaning') come in, and it is because these organs, through previous association or use of it, are adapted, as it were, to determine the object, that this object presents itself to the eye as a stimulus, as an object of interest and attention. Edouard Claparède[1] lays emphasis upon the fact that what he calls the absolute abolition of the muscular or kinæsthetic sense results in the utter incapacity for those coördinations requisite for the complex movements involved in the simplest type of attention.

The phenomena of mental blindness and mental deafness, so-called, bear out this same general conclusion. These pathological states may be described as the ability to see and hear objects (perceive them) without being able to put them to any use (to apperceive them).[2] The connections with the center which in experience has represented the chief content of the meaning of the objects (the center for the kinæsthetic sensations which report the use to which the objects are intelligently put) are severed or damaged. It is significant in this connection that we have instances in which the kinæsthetic area functions for the visual, but no cases in which the converse of this is true. Says Collins, "Patients with word blindness are sometimes able to read written or printed words and sentences by tracing the word (which, it is to be remembered, they see with customary acuteness) with the end of the index finger or with a pencil."[3] In an analogous manner, in the case of lapses, we give expression in speaking or writing to a letter or word which does not make sense, and which, as we say, we did not intend; we are quite unconscious of its irrelevancy or incongruity at the time of its utterance (we are mentally deaf or blind for the nonce), and scarcely believe that we have made the error when told of it. A still further corroboration of this principle is the familiar fact that meaning (for English-born persons) in the case of the Anglo-Saxon derivatives is primarily such as suggests objects, situations, actions, etc., as over against the more abstract and

[1] Du Sens Musculaire, 1897, p. 134.

[2] Cf. Külpe, Outlines of Psychology, pp. 174–175, and Starr, Familiar Forms of Nervous Disease, Chap. VI.

[3] Faculty of Speech, etc., p. 282.

remote meaning attached to the Latin and Greek derivatives, which tends rather to be in the visual and auditory imagery: this is true, of course, only in a general way.

As has been remarked on a previous page, much confusion in the study of the psychology of speech—as, indeed, of much other psychology—has resulted from a false antithesis of the 'sensory' and 'motor' processes. There is no more reason to regard the sensations connected with the activity of the sense organs as sensory than those connected with the activity of the muscles: on the other hand the sensations arising from the muscles are no more motor than are the sensations arising from the sense organs. A 'central' theory of the origin and nature of the kinæsthetic sensations is responsible for much of this confusion. The truth is, of course, that both and all processes are equally motor and sensory. The terms 'sensory' and 'motor' properly used are not content, but functional distinctions. This confusion in the use of the term 'motor' has led to the neglect of the proper sensory aspect of the kinæsthetic sensations. For example, Ballet says[1] that the meaning-idea arises ordinarily not only apart from, but temporally before the word-idea. For this he finds support in the mental development of the child, in the manner in which it gets, for example, the idea of a bell, or of an orange, through the association of separate sensations.[2] It is certainly true, as Ballet shows,[3] that the child gets first, for example, a simple auditory idea or sensation (usually by imitation, in Ballet's use of the word), and then later, associated with it, other ideas which, taken together with this, constitute the idea of the object. Finally the auditory or visual image, as the case may be, comes to stand for the entire object or for the 'meaning' as a whole, and we have the beginnings of that complex language development in which the word serves as a substitute for the idea or thought. But the trouble with Ballet's arguments for the independent development of the word-idea and the meaning-idea is this, that in the illustrations which he employs he does not exclude *all* use of symbols, such, for example, as the

[1] Le langage intérieur, p. 6.
[2] He adopts Charcot's schema; cf. a suggestive summary on p. 13f.
[3] Pp. 10, 11.

kinæsthetic, which, in our opinion, are most significant for the content of the meaning-idea.[1] When, therefore, he insists that the disappearance of the word-idea does not necessarily carry with it the disappearance of the meaning-idea (and that this is essential for the theory of aphasia) he confuses two possible uses of the term 'word-idea.' It is quite true that *a* word-idea (which is a *partial* symbol for a 'meaning') may vanish and yet the meaning, in some sort, remain; but if we could banish the *whole* symbolic complex which stands for the idea, it is questionable whether we would have any meaning-idea left. In other words (at least in adult life in the overwhelming majority of cases), no meaning is confined to a single symbol or to a single sense. Meaning is consentiently acquired. Certainly the word-idea is in a sense separable from the meaning-idea. Words are the tools of thought. They give it not only its flexibility, but also whatever of definiteness it has. But on the other hand the one cannot be floated off in utter detachment from the other. They are significant in experience only in relation to one another. Our internal language is for the most part in auditory verbal images. Where great use has been made of reading or writing the visual imagery may come to play a prominent part. In both cases the kinæsthetic imagery is the determinant factor in the 'meaning.' But any imagery may be predominant according to the constitution and training of the individual.

Egger, as Ballet says, is an *auditif*, and Stricker is a *moteur;* this explains the different accounts which they give of the imagery of internal language. But the auditory or visual verbal imagery never carries a 'meaning' unless it is combined with the articulo- or grapho-kinæsthetic imagery. This has been abundantly shown for the auditory imagery. D. Bernard[2] reports a case of mental blindness in which the patient could understand the meaning of the written word only when going through the motion of forming the letters as in writing. This illustration shows it for the visual imagery also. We may restate Ballet's scheme,[3] then, as follows. In writing (copying)

[1] Cf. p. 9, for instance.

[2] Progrès médical, 21, juillet, 1883; noted by Ballet, p. 55.

[3] P. 14.

or reading we have (1) the auditory sensation of the word (the word heard), (2) the visual sensation of the word (the word seen), (3) the articulo-kinæsthetic sensation of the word (the word spoken), (4) the grapho-kinæsthetic sensation of the word (the word written). If (1) or (2) be impaired the meaning of the word may be affected, but (3) or (4) must be impaired to remove entirely the meaning (that is, to render the person incapable of interpreting the meaning of the symbols). It is lesion of the centers corresponding to (1) and (3) or (2) and (4) which constitutes mental (and in this case verbal) deafness or blindness. Ability to interpret 'meaning' is quite compatible with the lesion of (1) or (2) only. It is just because the kinæsthetic is the fundamental imagery (and hence the imagery of 'meaning') that we find in most cases of functional aphasia that there is not a total loss of the apperceptive function, but only a more or less partial effacement of it. It depends altogether upon the degree to which the kinæsthetic imagery is predominant and independent of the auditory and visual imagery, as to how far the loss of the latter will disturb the ability to interpret the 'meaning' of an object or event. In Helen Kellar we have one of Nature's experiments in which the auditory and visual imagery is completely gone, yet where there is a rich experience of 'meaning.'

The Factors of Verbal Assimilation.—The complexity of the simplest of our experiences, when analyzed, has long been a matter of comment among psychologists. The exact determination of the number and relative strengths of the different components or elements thus isolated by analysis is just beginning to be studied experimentally. In that mental process, or complex of processes, which we call verbal association, as we have seen, it depends upon very variable conditions whether a single word or a part of word or a group of words shall be regarded as the psychological unit. From one point of view, that of the mere grammatical formation and analysis, the sentence breaks up into letters and words, phrases and clauses, more or less arbitrarily, according to the grammatological principle invoked. But from the point of view of psychological analysis proper (the psycholgy of the *meaning* of the sentence)

letters and words, and even phrases and clauses, as such, cease to be the significant units, cease to afford the useful lines of cleavage. The psychological units lie rather on the side of serviceability for 'getting on' in the activity-experience; they consist rather in the dynamogenic units of thought as they find expression in linguistic symbols. From this point of view a word may be psychologically very complex, and an entire sentence relatively simple. Instances are fresh in everyone's experience, of single words packed and doubly compacted with meaning, and of whole phrases and clauses containing scarcely sufficient meaning to arrest the attention as they are seen or heard. It is not into the analysis of the psychology of meaning (or, as we have called it, the psychology proper) of the language forms which serve as thought symbols, that we here propose to enter. This, as has already been emphasized, can be profitably approached from the genetic side only. Nor is it into the experimental isolation of the different factors that we here inquire; this also, as requiring a neurological basis, we have set aside as a problem for the present beyond our immediate scope. But the question which we may answer is, What do lapses suggest as to the elements or factors which go to make up that complex experience which we call verbal assimilation?

The first step in this analysis consists in determining what are, introspectively, the important component elements in our ordinary speech and writing consciousness, or, to use the older terminology, in ordinary processes of verbal association. Ordinary speech and writing are dependent upon a variety of factors for their normal maintenance and uninterrupted flow. These factors have customarily been grouped under three heads: (1) the visual, (2) the auditory and (3) the kinæsthetic. A verbal association (or, as he calls it, a 'verbal idea') in the sense of such a complex, according to Professor Titchener, "consists of an auditory complex, a mixture of clang and noise (word heard), a strain complex due to the adjustment of larynx and mouth necessary for the emission of a particular sound (word spoken), a visual complex, a written or printed form (word seen), and the strain complex due to the adjustment of hand and fingers necessary for the production of this form (word written)."[1]

[1] An Outline of Psychology, p. 198–199.

Or, for short, we may adopt Professor Hill's diagram, as given in his 'Genetic Philosophy.'[1]

A word is composed of
a. an *auditive* image—the word as *heard*,
b. a *visual* image—the word as *seen*,
c. an *articulate* image—the word as *spoken*,
d. a *graphic* image—the word as *written*.
} [kinæsthetic]

In most of our actual experiences all of these factors will not be present in equal degree. Clearly in certain abnormal cases one or more is entirely absent. But probably in all ordinary or normal verbal consciousness each factor has a more or less influential part to play. It is the determination in a general way of the mutual relations of these factors as brought out by the study of lapses that we are concerned to seek. The 'motor' or kinæsthetic factor is uniformly combined with the auditory or visual. This reduces the four factors in the above analysis to two, which we may call the auditory-motor and the visual-motor, or the auditory-kinæsthetic and the visual-kinæsthetic. By this connection of the two sets of factors it is meant to indicate, what we find to be a constant law of all mental process, that the sensori-motor arc or organic circuit is one process, that all thought and feeling tend to action, that all sensory naturally and inevitably flows over into motor activity and that all such activity is, in turn, reflected into experience as sensation. The first half of this principle has been diligently advocated in this country by Professor Baldwin in instructive researches on his children. According to this conception, the different elements of the speech faculty come under the law of what Professor Baldwin calls sensori-motor association, in the following forms: "auditory, visual, speech-motor, hand-motor (writing) memories," the former two developed in and through the latter two.[2] He, accordingly, distinguishes but two speech types, the auditory and the visual. The former is found most frequently, he says, among unliterary people who have not had large practice in writing and reading. That is, this hypothesis postulates that the units of our articulo-motor are the same as those of our sensory-auditory consciousness, and that the units

[1] P. 188: taken apparently, from Ballet, Le Langage Intérieur, p. 14.
[2] Mental Development in the Child and in the Race, p. 466.

of our grapho-motor are the same as those of our sensory-visual consciousness.

The fact that confronts us is the wide range of variability in the relative proportions which can exist among these factors. It is their great range of possible combinations that gives our language such flexibility and such adaptability to all shades of meaning. Without doubt we employ, without consciously analyzing the process, many variations in the use of the different sensory factors in our verbal ideas. This is ultimately the psychogenetic source of those grammatical (formal) distinctions which we have introduced into what we call the 'correct' use of language. It is this which makes possible the richness and variety of the language and literature of civilized man, and makes possible and necessary the linguistic sciences and the science of literary criticism. It is the possibility of such variety of union of the elements which come from the different sense modalities which make language the adaptable tool that it is in the hands of a versatile literary genus like a Homer, a Goethe, or a Shakespeare.[1] The usual psychological analysis states that spoken language is chiefly in terms of auditory images, and written language, chiefly in terms of visual images. This, with the modifications made below, is probably the case. Experimental data are constantly coming to the front in our psychological laboratories which tend to confirm the general principle.[2] In the case of lapses we find that the disturbing element or coalescent in the case of graphic errors is usually visual in form; the mere sound of the word, unless very pronounced or coming into direct conflict with the visual image, does not enter to the extent of interfering with the correct expression. Examples where the influence of the auditory imagery is felt are appended below (Table IX.). In oral errors, on the other hand, the disturbing element is usually auditory, *i. e.*, the *sound* of the just entering or just departing word is

[1] As Stricker says (Studien über die Sprachvorstellungen, p. 60), "Unsere gegliederte Sprache ist gleichsam flüssig, wir können sie disgregiren, wir können Silben und Laute verschieben, und darin ist eben ihre enorme Entwickelungsfähigkeit begründet."

[2] Cf. a review of experiments by Schiller on school children, in *Am. Jour. Psychol.*, Jan. 1899.

influential. Baldwin refers to a case of aphasia which brings out these relations clearly. It is the case of a patient "who spelt aloud a word wrongly when he *wrote* it ('candd' for 'cat'), but at the same time pronounced it correctly, as he heard it. This means that his spelling movements, letter by letter, had been learned in association with the making of the letters and the sight of them, while the learning of the word's pronunciation, as a whole, had been in connection with its sound."[1] Assuming this position in general to be the correct one, let us look at these factors a little more in detail.

We take up the speech consciousness first because it is psychogenetically more primitive than the writing consciousness. Probably general expressive reactions and mimic reactions precede articulate speech; but almost certainly writing was developed later than speech. This is made more probable by the facts of mental pathology, which go to show that the writing consciousness is the less stable of the two, suggesting its relative lateness of origin.[2] Written language is not, as Keraval shows,[3] the immediate symbol of the object or of the idea of the object. It is but a representation or sign which stands in most cases for the articulate or spoken symbol for the object. Written language thus only indirectly stands for the object; it is the symbol of a symbol.[4] According to the same author,[5] the Chinese, Egyptians, etc., think more in visual and grapho-kinæsthetic than in auditory and articulo-kinæsthetic images, which is just the reverse of the European languages. Yet, in spite of these peoples, writing has become phonetic, that is, the reproduction or symbolic representation of the spoken symbols rather than the direct representation of the object.

We have said that speech is dependent primarily upon the auditory imagery. There is reason to believe that the motor center for speech never becomes independent of the sensory center which presided over its education. J. Cohn, in his re-

[1] Mental Development in the Child and in the Race, p. 470–471.

[2] Cf. Collins, Faculty of Speech, etc., p. 68.

[3] Le langage écrit, p. 33 f.

[4] "L'écriture est un dessin conventionnel des sons" (p. 160).

[5] P. 40.

searches on the auditory-motor and visual memory,[1] finds (1) that an auditory-motor memory is more profoundly disturbed by auditory-motor stimuli than a visual memory would be by the same stimuli, and (2) that when the auditory-motor memory is thus disturbed greater use is made of visual memory. In other words, the auditory-motor imagery is the important imagery for speech. This is as true of internal speech, or 'mental pronunciation,' as it is of ordinary vocal speech. As P. Keraval says[2] "C'est la parole intérieure qui souffle la parole extérieure, qui dicte l'ecriture, et, durant la lecture, c'est elle qui reproduit intérieurement les mots lus, si bien que les images visuelles sont intimement unies aux images auditives dont elles sont, dans une certaine mesure, dépendantes." Says Collins, "The sound of every articulated word acts as a stimulus to the auditory center for the next. If the auditory center has been destroyed there is no such leader in the memorial order of words, and we have the frequent occurrence of *lapsus linguæ*, or paraphasia. * * * In a similar way the auditory center guides the action of the articulatory center in the employment of internal language."[3] As another writer says, "Peripherally aroused sensations from actual articulatory movements are not essential for inner speech; their reproduced images suffice. When present they raise the mental presentation of words to greater clearness."[4] Probably mental articulation employs the same sensori-motor circuit as for audible articulation, but it stops short of sufficient innervation to overcome the neural resistance necessary to call into action so complex a musculature[5] as that necessary for audible articulate speech. It is a lesion that disables or militates against such externalization of language in either spoken or written form that is properly called motor aphasia. The ordinary influence

[1] Experimentelle Untersuchungen über des Zusammenwirken des akustisch-motorischen und des visuellen Gedächnisses, Zeitschr. f. Psy. u. Physiol. d. Sinnesorgane, XV., p. 182.

[2] Le Langage Écrit, p. 155.

[3] Faculty of Speech, etc., p. 251-252. Cf. reference, above, to Onuf, p. 139–140.

[4] E. B. Delabarre, in *Psycholog. Rev.*, May, 1897, p. 326–327.

[5] In articulation at least four sets or groups of muscles come into play, (1) the respiratory, (2) laryngeal, (3) lingual, and (4) the buccal. Each has its definite representation in the Rolandic area (cf. Collins, p. 82).

of the auditory imagery, chiefly in speaking (cf. the ideo-motor oral errors in the tabulations), takes the familiar form of echolalia. A table of such errors has been made for another purpose (to be mentioned below), which shows very plainly the influence of the sound of one word upon the oral production of another (Table XI.). A rough measure of the part played by the auditory imagery as a check on the correct enunciation in speech is found in the disturbing effect of total or partial deafness on the speech of one who previously had both normal hearing and normal speech. Onomatopoetic words (such as buzz, hiss, splash, whirr, etc.), and words whose spelling give no hint as to their pronunciation (such as phlegm, *Pall Mall*, Majoribanks, Magdalen College, Bowdoin, etc.), often give trouble here. The confusion of such words as 'two,' 'too,' and 'to,' of 'I,' 'eye,' and 'aye,' etc., especially in writing, is due chiefly to the influence of the auditory imagery.

The visual factor is usually introduced in reading, as distinguished from speaking. Here, as elsewhere, the kinæsthetic imagery is a constant factor. We question the accuracy of the introspection in the case of the subject who is reported by W. B. Secor[1] as not dependent upon the articulatory imagery in reading. There is no doubt that this writer's conclusion is correct when he says that practice brings the visual imagery into greater prominence, but that it is possible to 'grasp the meaning of printed or written matter through the eye alone without the aid of articulatory images' is open to grave question. The probability is that the kinæsthetic imagery has changed from a gross to a finer type, say, from the grapho- or articulo-kinæsthetic to the imagery connected with the finer movements of the eye, but that it vanishes entirely is *apriori* improbable and *aposteriori* undemonstrated. Errors occur chiefly when the visual and the auditory imagery come into conflict. For example, in the following case the auditory word-idea came into conflict with the visual word-idea, when a person, wishing to look up a meaning of the German word 'geneigt,' first looked by mistake under 'ge,' in the lexicon, and then, observing his mistake and ostensibly rectifying it,

[1] *Am. Jour. Psychol.*, Jan., 1900, XI., No. 2, pp. 226, 232.

looked under 'gn,' the sound image of the word triumphing over the visual image. Similar conflict of imagery occurs in writing. An example is found in the following error in writing on the typewriter, where *er* was written for '*ur*gent,' the auditory image of the first syllable of the word predominating and driving out the visual image. Other similar cases are more or less fully treated throughout the tabulations under Remarks. The effect of the visual imagery on listening is well shown in W. B. Secor's experiments[1] in which, for example, when '*t* was exposed, and *dot* pronounced, the subject saw *tot*.' This was the case when the letters involved belonged to the same class or group. "When the letter was followed by a word whose initial or final letter belonged to a different class, the subject saw the word pronounced with the exposed letter hovering about in space near the incongruous initial or final. When, for example, *d* was exposed and *pelt* was pronounced, the subject saw *pelt*, but somewhere near the *p* he also saw the *d*. The *d* 'seemed to be trying to get into the word.'"

The kinæsthetic factors in speech are very much more important than was formerly recognized. It fact, it is probable that every speech idea is an auditory-kinæsthetic idea; the separate treatment of them is possible only by abstraction. H. Schiller shows in his researches on learning to spell by children that (1) merely hearing words pronounced is the least effective way of learning to spell; (2) that exposing the word-form to the eye reduces the number of errors somewhat, but that (3) writing the word, either on paper or in the air, or soft or loud speaking of the word (that is, the introduction of the kinæsthetic, in addition to the auditory and visual sensations) greatly reduces the errors.[2] This is why, when trying to study in a noisy room, one involuntarily begins to speak aloud the sentences he is reading, in order to concentrate more fully the attention upon them. Thereby one gets a richer complex of sensations (the kinæsthetic and auditory in addition to the visual) which will serve to fix what one is reading, in the mem-

[1] *Op. Cit.*, p. 235.
[2] Cf. *Am. Jour. Psychol.*, Jan., 1899, p. 307.

ory.[1] Stricker, in his 'Studien über die Sprachvorstellungen,' has called attention to the sensations which accompany ordinary vocalization (articulation). For example, in the case of the consonant B we have a sensation in the two lips, in the case of D in the tip of the tongue, in K in the root of the tongue, in F in the under lip, etc. The pronunciation of vowels also is accompanied by sensations of a similar sort but less pronounced and always in conjunction with some consonant. These are the sensations also which accompany mental pronunciation[2]—what he calls the 'Initialgefühlen.' He concludes that (1) with every idea of a tone there is inseparably associated a more or less distinct sensation in the organs of articulation, (2) these sensations are located in the muscles, (3) these sensations are similar to those which accompany the actual expression of tones. He uses the following introspective evidence. If when quiet, with the eyes closed, you let a familiar stanza of poetry pass through your mind, and direct the attention at the same time to the organs of speech, you will find or feel an inward tendency in the mouth, lips and tongue, to speak the words you are thinking ('mitreden'). This is not noticeable if in place of the stanza of poetry you think of some popular air with which you never have associated any words; but now the inward feeling of strain sensations is located rather in the larynx, while in the case of remembered tunes simply which one has never sung, the feeling seems to be situated indefinitely somewhere in the top of the head. Thus he insists that in speech we remember words primarily by what he calls the 'Initialgefühlen,'[3] or as we would say by

[1] Cf. Stricker, p. 47. "Stricker's assertion," as Delabarre says (*Psycholog. Rev.*, May, 1897, p. 326), "that no sensory elements are present in his motor verbal images, and that they consist in innervation-images, is shown [by R. Dodge] to be indefensible." Cf. also R. Dodge, "Die Motorischen Wortvorstellungen," Halle, 1896—reviewed in the *Rev. Philosophique*, XLIII., p. 640. The close connection of the auditory and kinæsthetic imagery is brought out in the cases cited by Stricker (p. 105) from Erdmann and Lewinsky, where simple thinking resulted in the throat becoming dry and the voice husky.

[2] For examples of errors in 'mental pronunciation' see Table VIII.

[3] Cf. p. 44; cf. also p. 45, where he says, "Die gelesenen Worte ohne Mitwirkung des motorischen Sprachcentrums nicht verstehen kann," and p. 42, where he says, "Das Mitsprechen ist im Beginne des Unterrichts ein Mittel um das Lesen zu erlernen." Cf. also Collins, pp. 67, 68, 114, 131. See also H. Davies, 'The Growth of Voluntary Control,' *Psycholog. Rev.*, Nov., 1899, p. 643.

'motor' or kinæsthetic imagery. It is a matter of common occurrence for persons to accompany their reflective moods by words audibly, though unconsciously and involuntarily, expressed. Very often we see persons on the street or engaged in manual labor talking with themselves, *sotto voce*. Thought certainly tends to speech, or at least to expression of some sort (and where speech is a deeply grounded habit, it tends strongly to speech). Children and uncultivated persons move the lips and mumble to themselves when reading. Everyone probably has at times the consciousness of the impulse to speak the words, to articulate the syllables he reads, though in cultured persons this tendency is, as a rule, almost completely inhibited. Where it is a fixed habit the person may be said to be an *articulo-moteur*, just as we speak of the *auditif* and the *visuel*.[1] Here, then, is evidence from the ordinary consciousness that the visual and auditory ('sensory') and kinæsthetic ('motor') speech centers are very closely interrelated, and not only so, but that through these centers, sensory are constantly passing over into motor processes, without the mediation of something wholly not neutral, without (so certain neurological theorists would maintain) the necessity of a separate coördinating mechanism.

TABLE VIII.

List of Errors Occurring in 'Internal' Speech, or 'Mental Pronunciation.'

Error.	*Correct Form.*	*Remarks.*
This fixing	This fixed grouping.....	Thinking.
we are led from this task	we are led from this to ask..	Reading.
Prise	rise of Protestantism...	In a dream; the person before retiring had been engaged on an address on this subject.
stell body	cell-body stains.....	In proof-reading; the lips did not perceptibly move, yet there was a distinct 'strain' sensation in the lips.
lings	lungs and wings	Reading.
fills, gins, etc.	fins, gills, etc	Reading.
bread, cie, and pake	bread, pie and cake	Repeating mentally, a list of things to be gotten at the bakery.

[1] Cf. Stricker, p. 40.

dame, leaf, and blind	lame, deaf, and blind	Reading.
on a water-leaf lily	on a water-lily leaf	Reading.
entitling nobles	ennobling titles	Reading.
to roll untangled records	to unroll tangled records	Reading.
machine-stetched him	machine-stitched hem	Reading.
a roope and a nose	a rope and a noose	Thinking.
must be taken as bare really	must be taken as really bare	Reading.
chapel place	palace chapel	Reading.
Five Thousand Walls of Roll-paper	Five Thousand Rolls of Wall-paper	In reading an advertisement in a newspaper.
it is even more	it is more even and sedate	Reading.
in modes predetermined by the previous organization	in modes predetermined by the nervous organization	Reading.
the rain wept sky	the rain swept sky	Reading.
their special furtherization	their further specialization	Reading.

It already has been remarked that the factors of the writing consciousness are primarily in visual or visual-kinæsthetic terms. One becomes conscious of his own speech in one or both of two ways: (1) one hears his own voice, (2) one feels the movements in the larynx, etc., by which speech is produced. In a similar way, in writing, (1) one sees the page on which he is tracing the letters (one also may hear the pen scratching along the manuscript, and can tell roughly how many lines, words and letters, or even strokes, have been written; in some instances the elimination of the auditory control of the writing is very disturbing), (2) one feels the muscular sensations in the arm, hand, fingers, etc., by which the writing is produced. As we have seen in the experimental production of lapses the mere closing of the eyes does not exclude all visual control, since the page may be strongly visualized ('imagined') even when all direct vision is excluded. Of course, the kinæsthetic imagery cannot be separated from the visual process in writing any more than from the auditory process in speech. The process is more complex than upon first view it appears to be. In the case of copying there may be a direct transference from the visual over into the motor process. In the case of writing from dictation we first receive auditory impressions (sound-images), these are then interpreted (and by some process of 'retention' the meaning of a series of such sound-images is utilized

for reproduction in the motor process of expression which we call writing), and translated over into kinæsthetic (possibly also into visual) terms before expression in the form of writing.

It is practically impossible to determine with experimental accuracy the degree to which the kinæsthetic is helped out by the visual imagery in writing. So far as direct visual control is concerned, most people can write nearly as well without as with the eyes open. Table XII. gives examples of errors due to similarity in appearance (visual similarity) and to similarity in formation (kinæsthetic similarity) of adjacent letters, word-parts or words. The profound influence of the kinæsthetic imagery on writing is easily tested in a rough way by (1) writing one's name on the page before him, then (2) over one's left shoulder (if right-handed), then (3) on one's forehead, then (4) over one's right shoulder. The difficulty that is here introduced by the unusual positions is obviously little or not at all visual, but muscular (kinæsthetic). The importance of this grapho-kinæsthetic imagery is seen in the fact that the ability to write may be retained in spite of both verbal deafness and verbal blindness.[1] Many grapho-kinæsthetic errors, thus, are doubtless classified in the above table (XII.), since it is often impossible to determine whether a lapse is due to the similarity visually or kinæsthetically of the contiguous elements. In the following error the writer had a distinct feeling that it was the similarity in the manual formation of the two words that occasioned the lapse: 'if we ould' was written for 'if we only could.' It must be noted here that in handwriting (the writer's, at least) there is essentially no difference in the formation of 'n' and 'u.' The *ou* (or *n*) *l* by assimilation gave the *d*. The following are other examples. 'And undifferent' was written for 'And under different circumstances.' Here the *di* and *de* are formed very much alike. Again, 'or the acid' was written for 'or the action of an acid.' Here the recurrence of the *ac* was the occasion of the error.

The influence of auditory imagery directly upon the formation of letters in writing is as a rule inconspicuous. Persons sometimes repeat words or phrases (or even letters), either aloud

[1] Cf. P. Keraval, Le Langage Écrit, p. 167.

or mentally, which they are attempting to copy, write at dictation, or to compose. This is especially true when one is disturbed by some counter stimulation. When spoken aloud, the hearing of the words repeated (as well as seen, or heard from dictation) serves as a distinct help in getting the subject-matter down on paper correctly. Sometimes the two sets of kinæsthetic imagery which are chiefly concerned in the act of speaking and the act of writing, respectively, come into conflict. Raymond Dodge in his 'Die Motorischen Wortvorstellungen' speaks of this experience in writing, where the two groups of kinæsthetic sensations, those representing the reflective process of composition (chiefly articulo-kinæsthetic) and those representing the actual act of writing (grapho-kinæsthetic) come into conflict, though he says that in his case this conflict does not extend as a rule over more than a syllable or very short word. In the cases recorded in Table IX. the persons testified to the distinctly felt influence of the auditory imagery in producing the errors.

Table IX.

Errors in Writing Due to the Influence of Auditory Imagery.

Error.	*Correct Form.*	*Remarks.*
bego	begun on	Letter-writing.
because everybody on	because everybody wants to move at once	Letter-writing.
But kno	But no, through	The word 'know' had been used in a previous sentence and was reverberating in consciousness.
ref	reference for	Note that 'f' and 'v' are phonetically similar.
whistling too	whistling tunes	Note that as commonly pronounced, 'oo' = 'u.'
shave	share	Attempting to carry on a conversation while writing. Spoke the word 'half' just as was writing the word 'share' (here again, 'f' = 'v,' phonetically).
and how anybody good get into a quarrel with S.	and how anybody could get into a quarrel with S.	Letter-writing.
no end	no *n* around	In composition.
ex	x	In composition.
artical	article	In composition.

hy	hieroglyph.....	Note the influence of the sound of the 'y.'
by	bicycle.....	Note the influence of the sound of the 'y.'
horce	horse	*ce* = *se*, phonetically.
psychologysti	psychologist	This error was made in type-writing. The word 'psychology' was first written by mistake for 'psychologist,' and in correcting this error the writer felt the *i* force (auditory) of the *y*, and hence left out the *i* where it should have been, though it asserted itself later out of its normal position.

The Laws of Verbal Assimilation.—In the study of the tabulated errors several important principles appear, which we have called laws of verbal assimilation. For the most part these are principles with which we are already familiar in psychological analysis; but they are so clearly reinforced and illustrated in this new field by this fresh collation of data that it is thought useful to restate them in this connection—especially since it involves the reconstruction of some of them. We may very safely assume as a fundamental principle of association, that an idea,[1] whether it be the comparatively simple idea corresponding to a letter or the more complex idea of a word or a phrase, never appears in consciousness nor becomes crystallized into action unless there is a definite reason why this particular idea should appear in preference to all others. This definite reason it is the purpose of generalizations from these data to aid in elucidating. Construed in the terms of the older psychology, such association is said to take place in accordance with some one, or some combination, of the following laws. The law of association by similarity would maintain that similar letters or words occurring with relative frequency tend to conflict and coalition. This is sometimes called the law of similarity and contrast. The law of association by contiguity would hold that letters or words occurring in relatively close succession, or simultaneously (*i. e.*, in the 'specious' present), tend to fuse or coalesce. This is

[1] The term 'idea' is here used in a broad sense (Titchener's use in his 'An Outline of Psychology').

called also the law of repetition. These two laws, as we shall see below, are best stated as one. They embody obvious truth; but, obviously also, they are the product of a sheer content analysis of the associative process. What is more needed and more in line with the present functional mode of psychological analysis, is some additional statement in the general terms of habit and attention. Another law recognized by both the older and the newer psychology alike, and called the law of emotional preference or the law of the emotionally congruous, is an important one from this point of view in determining the character of assimilations. According to this law those letters or words are associated (and in the case of lapses fuse or coalesce) which have some 'personal' reference. This will be taken up further below.

The first law may be stated as follows: From the standpoint of the adjustment, errors occur in the breaking up of an habitual (familiar) association. From the standpoint of the tendency represented by the habit, thus modified, errors tend to take familiar forms, that is, forms which have a meaning for normal experience. These, as we shall see, are two statements of the same principle. That errors occur in the breaking up of an habitual association is shown by the fact that it is chiefly in the case of a difficult (because unusual) juxtaposition of heard or seen symbols (*i. e.*, in a readjustment requiring attention) that the errors occur.[1] This is further borne out by the fact that habit immediately reasserts itself, as shown in the strong tendency, evident in the larger errors, toward the formation of familiar words (cf. Table X.). It is a commonly recognized fact that habit tends to make reactions reflex and automatic, that, as Baldwin says, consciousness tends to 'evaporate' from such reactions. Habit, as he says, 'means loss of oversight, diffusion of attention, subsiding consciousness.' "That which is habitual is accompanied by least consciousness."[2] When in doubt or perplexity or hesitancy, until a decision is reached, it is the habitual thing that is done. Then at the moment or point

[1] Cf. in this connection Table I. which contains a list of cacophonous expressions in the pronunciation or writing of which the errors were made.

[2] Cf. Feeling and Will, p. 49, and PSY. REV., I., p. 612.

of readjustment, the attentional process culminates in a new act. The phenomena of aphasia support what we know from common observation, that as a rule we forget those words with which we are least familiar, and consequently the expression of spontaneous thought is always in terms of frequent use. This natural law of habit is strikingly confirmed by a study of lapses. Here also attention seems to enter at the point of the breaking up of a habit, and lapses are, so to speak, the by-products of the transition. The readjustment (and hence the attention) may take place suddenly or gradually, or in an oscillatory way.[1] Alliteration and rhythm, if moderate, seem to aid the attentional process, but when excessive only tend to break it down and aggravate coalescence, as in stammering.[2] On the other hand, the confusion resulting from the recognition of a mistake just made or from the contemplation of a possible mistake, only plunges the attention into deeper distraction. The immediate effect of the consciousness of error is only to make the already incoherent mental states more disordinated. Disturbed states of the attention always verge on chaotic lapses. Often the question arises (as in the following error—in which 'nowe' was written for 'now we') as to whether the one letter receives the attention usually given to the two, or the two letters, on account of their proximity as well as similarity, simply the attention usually given to one, the resulting error forming a hybrid. In some cases we have the idea-of-a-doubled-letter anticipated, but not the particular letter form, or another letter is substituted. For example, 'givess' was written for 'gives off,' and 'inatt' for 'innate.' Here the habit was broken up sufficiently to precipitate *a* double letter, but not *the* double letter necessary for the correct expression. The following are similar instances: 'Glsaa' was written for 'glass,' 'sudeen' for 'sudden,' 'acciddentally' for 'accidentally,' 'perisitence' for 'persistence,' 'claaed' for 'called,' 'accosiation' for 'association' (cf. also Table V.). The attempt to change from the English to the American use of the 'h' before certain words furnishes an example of the disin-

[1] Wundt has emphasized the factor of oscillation in attention (*e. g.*, in expectation)—*Physiol. Psychologie*, II., p. 274.

[2] The relations of lapses to stammering merit investigation.

tegrating effect of the breaking up of an old habit, and the errors which accompany the more or less arbitrary establishment of a new habit. In many cases the *lapsus linguæ* or *lapsus calami* shades off into what is called a *lapsus memoriæ*, as when in numbering successive pages at the top, the figure '8' was written on two consecutive pages instead of in the numerical order ('8,' '9'). This is usually called a simple case of forgetting, caused by the passage from one page to another, yet it is described with equal truth as an example of persistent substitution (*i. e.*, marking the point at which the attentional fell back again into the habitual process). A similar instance is the case in which '(1), (2), (2); (2), (3), (3)' were written for '(1), (2), (3); (2), (3), (4).'

The strong tendency of errors to take the form of familiar words or syllables corroborates the view above stated, since it shows the relatively unstable process of attention passing over again into the relatively stable and fixed habitual process. Recently it has been found in experimentation upon memory and association,[1] that in the case of words heard and of words seen, even when the words seemed to have little natural relation to one another, yet the tendency was strong to force the parts of the series into some sort of intelligible combination. This tendency toward the completion of a word is pointed out also by Ziehen in his experiments on association in children, in which he notices that the tendency to word-completion is very strong, as, for example, in 'postal'-card, 'heart'-shaped, 'post'-office, etc.[2] So, again, Pillsbury in connection with his experiments, shows that there is "always a tendency to connect the separate impressions into something with a definite meaning for consciousness."[3] There is, in other words, a felt demand in all cognition, in all thought, for completion, for integration, and

[1] Mary Whiton Calkins, Short Studies in Memory and in Association, from the Wellesley College Laboratory, PSY. REV., V., p. 5.

[2] *Amer. Jour. Psychol.*, Jan., 1899, p. 306. This tendency toward the completion of the word or expression is also brought out in what we have called abbreviation errors (see above) where, for example, 'b. begs' was written for 'bed bugs' and 'cons clief' for 'consc life.'

[3] *Amer. Jour. Psychol.*, VIII., p. 372. Cf. what Bosanquet says of the significance of this fact for logical theory (Essentials of Logic, 1895, p. 76 f).

if the completion is not mediated from without, it is mediated from within (from habit, from the general stock of knowledge, so to speak). In this way we get the errors which from different points of view we have called illusions or hallucinations, and lapses. A new percept or idea of an object does not enter (the adult) consciousness alone, but always in connection with the perception of other objects. The new element is connected with others also through reproduction, and these likewise, themselves, have previously been connected with other similar elements. The object in all these relations tends to appear in consciousness as a unit. Striking examples are cited by Titchener from everyday life.[1] Pillsbury also cites the overlooking of misprints in proof-reading, the subjective completion of the rough daubs of stage scenery to a landscape, the seeing of figures in fire, in the clouds, seeing ghosts, etc. As he says, "Equally good, though less striking instances, are found in nearly every form of perception. When the process is carried a step farther, *i. e.*, when the associated elements outweigh the original in number and importance, or when the conscious connections do not correspond to the connections of the moment in the external world, we have 'illusion' instead of perception."[2] Table X. presents a list of errors showing the tendency to form familiar words or word-parts. The same tendency was brought out in the experiment in which the subject was required to write as rapidly as possible words and sentences which should make no sense, and in which forms which had some sort of meaning in the ordinary use of language asserted themselves in spite of the attempted inhibition of all such. Again, when the subject was required to copy a foreign language, in the Latin characters, or to write at dictation English sentences backward, the tendency was strong to

[1] An Outline of Psychology, p. 196. Cf. also Edridge-Green, Memory and its Cultivation, p. 233, where attention is called to the fact that the aphasic patient "will often, if the first part of a sentence be repeated to him (it being one with which he is well acquainted), instead of repeating the portion which was orally delivered to him, finish the sentence." The same tendency to use familiar rather than alien forms is found in a comparison, for example, of French and English aphasic utterances.

[2] *Amer. Jour. Psychol.*, VIII., p. 332.

make normal English sense out of the material. Moreover, it is observable that whenever the hybrid resultant form can readily take the character of a familiar word it facilitates the production of the error. The following is an example: A person in reading aloud from a book read 'seemed to correct the firmness of this statement' for 'seemed to confirm the correctness of this statement.' Here, the fact that the error could take the form of good English words with some semblance of sense seemed to facilitate the mistake in this completely carried-out form. In some cases in the experimental production of errors the subject found that he had written several words in a purely automatic way, and only knew that he had done so by recognizing, on opening his eyes, that the errors were in his own handwriting (cf. Table XIII.). Similar cases are related of reporters falling asleep, and still going on taking down a speech. A large proportion of the verbal errors recorded in the tables involve connectives (the, and, to, at, as, if, of, etc.), by reason of the fact that attention is called to them by their comparatively unfamiliar or unusual juxtaposition with certain other words in the sentence. The same is true of letters and word-parts. So long as they are found in the word or sentence in familiar relations, habitual processes assume charge of them; but when such relations are relatively unfamiliar, the habitual process is broken up—attention goes, as we say, to the difficult point in the adjustment, and errors occur. Other things being equal, that factor in a sensation complex will be modified by association which has the least number of felt relations (or significance). It is the nondescript which is kicked about from pillar to post. The most firmly fixed is also the most abundantly associated, and these elements tend least to error. That is, the consentiently acquired verbal factors tend less to error than those acquired (chiefly) through a single sense, because the habit of correct expression has been so firmly fixed in the former case that, unless exceptional circumstances arise, these words or word-parts tend to be produced always in their correct form. To the question, then, whether errors involve letters, word-parts and words which are more frequently used or those less familiar by reason of less frequent use, it must be answered,

that both are involved; the familiar forms are involved in error because placed in unusual relations with the relatively unfamiliar. It is in the process of readjustment, which is the process of attention, that these errors become apparent, and it is with relation to this process that they must be interpreted.

Stated in other terms, this might be called an illustration of the general law of mental economy of effort. According to Stricker, when a series of words beginning with the same consonant follow each other in an alliterative sentence, as "Roland der Riese am Rathhause zu Bremen,' only one 'R' is seen at once, whatever the span of the reading consciousness for the other letters; that is, the marginal alliterated forms are minus the initial 'R,' so that these are really seen as *e. g.*, 'iese' and 'athhause."[1] The organism tends to accommodate for a given stimulus but once, unless rhythm takes it up (and then it is often hard to stop). This is why in rapid reading (the writer has noticed it especially in proof-reading) letters, word-parts and even words and phrases are dropped. For example, the word 'very' suffered 'lapse' when preceded by the word 'several,' which contains, as three of its component letters, the same as the first three letters of the word 'very' (viz., 'ver'): the whole passage was as follows: "In several very small nodular enlargements." The following is another instance: 'earlies stages' was written for 'earliest stages.' In this connection are to be noted also those very frequent errors of type-setters, who omit passages because of the occurrence of similar words in close proximity in successive or near lines. Many cases of ellipsis seem to result from the sense of having already pronounced or written the letter, word-part, or word, or its equivalent. 'Ney Y' was written for 'New York.' In writing the capital 'Y' the writer thought she had written the letter 'Y,' but could not understand how or where, until her eye caught the mistake on the page. In many cases the realization of the necessity of writing the recurring word or letter more than once (contrary to the ordinary run of the words in a sentence) seems to elicit an over-dose of the attention, so to speak, and the word or letter is anticipated, precipitated out of its regular order (transposition), substituted

[1] Cf. Sprachvorstellungen, pp. 86, 87.

for another, or repeated more than the sense calls for. The following is a case in point: 'solved in in initial assumption' was written for 'solved in the initial assumption.'

Table X.

List of Errors Showing Tendency to Form Familiar Words or Word-parts.

Graphic.

Error.	*Correct Form.*	*Remarks.*
real	reeling off.	
as and	as an end.	
disturbution	distribution.	
our	of your.	
each set of questions when they are set	each set of questions when they are sent	Perhaps an example of persistence.
dormat	dormant.	
some sick, some sin	some thick, some thin.	
descriping	describing.	
journal	journey.	
des	disturb.	
h ad	h at last.	
no dot	do not.	
tub	but.	
ist	its.....	Was engaged in translating from the German.
Eegypt	Egypt.	Experimental.
Aall	All.	
Eexamine	Examine.	
Aage	Age.	
in Aar	in Art.	
Aarter	Arter.	
and daher	und daher	Translating.
specificsch	specifisch	Translating.
was whiche	was white on.....	Experimental.
Apr. 9, 189	Apr. 9, A.D. 30.....	Influence of habit.
E. g. Herrok	E. G. Herrok.....	Influence of habit.
contract	contradiction	Occurred several times.

Oral.

Error.	*Correct Form.*	*Remarks.*
ware-fell	well-fare	
conversation	conservation	
Your presence is recorded	Your presence is requested by order of the president.	
do	due to.	
Com, ing up !	Come, ring up !	

festival of ether	festival of Easter.	
covered with carbuncles	covered with barnacles.	
celebrated it	celebrate it.	
such witches	such riches have wings.....Anticipation also	
so as to	as to.	
as in the Autumn leaf	as in the Autumn time the leaves fall off.	
applauses and peaches	apples and peaches	
in modes predetermined by the previous organization	in modes predetermined by the nervous organization.	
amazed	dismayed and aghast.	
staid and sedate as he always was in the state-room	staid and sedate as he always was in the recitation-room.	Example of persistence also
He took at least	He took leave at last.	
blind and mad	mild and bland.	
led you to left it	led you to leave it.	
shut up !	shh.....	Intended immediately after uttering the admonitory 'shh' to say, ' Shut the door !'
sixty years of old	Sixty years of age..... .....Influence of habit.	
ac (sh)	acts	The *sh* is to represent the sound in the second syllable of the word 'action ' which came to consciousness *after* the error had been made.
in relation to the reality	in relation to the impression immediately present.	Experimental visual-vocal method (see above)
removal of the present affective science	removal of the present affective state.	do.
regarded as an intermingled began	regarded as an intermediate stage between.	do.
condition one another after	condition one another and form.	do.
volitional act are actually formed	volitional act are usually far from.	do.
subordinated under a single submitting	subordinated under a single predominating one.	do.
processes which express	processes which present....	do.
as the most complex efforts	as the most complex form of affective.	do.
an emotion is an	an emotion in all its.....	do.
change in change	change in convergence.....	do.
to objects from	two points from the subject..	do.
exactly in time for	very rapidly to its maximum.	do.
ideas have sides	ideas have a decided.....	do.
there obtain	there are certain other.....	do.
which had entered a port	which had wintered in the island.	do.

for example, an assumption	for example, a succession of a number.	do.
through which opposite thing	through which composite feelings.	do.
are merely secondary aspects	are always mere secondary qualities.	do.
by abstraction of sincerity	by abstraction as if it merely.	do.
special providence	special province.	
face wore a peaceful	face where a powerful eye..	do.
superhuman forces of energy	superhuman energy of a ferocious.	Experimental visual-vocal method (see above)
eyrie ickery philosophy philosophy	eyrie oury ickery ann phillosy phollosy.	do.
six seven	six Severn salmon.....	do.

The second law of verbal assimilation is as follows: adjacent similars tend to conflict and coalescence. Or, more explicitly stated, this law runs thus: contiguous substantives tend to coalescence when they contain wholly or partially identical elements; contiguous connectives tend to coalesce when they stand in identical or analogous relations to adjacent substantives. This is in reality but a restatement in the terms of a single principle of the so-called distinct laws of similarity and contiguity, about the priority of which there has been so much controversy. Various writers have stated the essence of the contention that is here made, though in abstract and logical rather than in concrete and psychological terms, when they merge both principles into what is called the laws of 'partial identity, or 'partial coincidence.' Applied to the phenomena here under consideration, this principle would maintain that it is the contiguity of similar elements, in the two letters or words concerned, that causes them to coalesce. For example, a person said, 'You want the hot so' for 'You want the fat so hot.' Here the two 't's' are the similar elements occasioning by their contiguity the lapse in question. Thus it appears that we may have coalescence due to the succession of similars or due to the simultaneous[1] existence of either similars or contrasts, in analogous relations, one of these being an element in the psychic fringe. The reason that similars tend to conflict and coalescence is, as has been hinted above, that attention tends to function but once for

[1] For our present purpose, successive association may be regarded as but a series of simultaneous associations which arise successively.

each new adjustment or readjustment, and it is the relative under- or over-functioning of the attention for a given ideated adjustment that occasions the fluctuation, or deviation, or lapse. From this point of view unlike elements are involved only by reason of their juxtaposition to, or association with, like elements. The unlike, other things being equal, will hold the attention: it is the like, the uniform, the monotonous, which allows the attention to lag, and thus permits of errors in the transition from this state of comparatively habitual monoideism to a relatively polyideic state of attentive consciousness. Because the two letters, or word-parts, or words, are alike, one mental process serves for the two, and the other is dropped or mutilated. This is the law of economy everywhere in mental life, not to give equal attention to two stimuli which are exactly alike. Uniformity of stimulation means reducing the degree of attention. Identity of stimulation means the 'lapse' of some of its elements from consciousness—or, ultimately, the complete 'lapse' of consciousness as a whole. This is the functional meaning of Stout's principle of 'continuity of interest.'[1] Of course, we never have any such thing as complete identity of the two similar elements associated, but rather the one simply intensified or reduced by the other, the process that we have here called assimilation.

A large percentage of the errors occur under conditions where two or more like-sounding (chiefly in the case of oral errors) or like-appearing (in the case of graphic errors) letters, syllables, or words stand adjacent to one another. That is, many cases of error are facilitated by phonic or graphic resemblances. The former we here have called euphonic; the latter, eugraphic. Euphonic confusions are such as arise from the mistaking and transplacing of letters, word-parts, or words which sound alike. Eugraphic confusions are such as arise from the mistaking and transplacing of forms which appear alike. Euphonic errors are very numerous, especially in the case of anticipatory substitutions. It is noteworthy that this takes place rather between two thin or between two thick vowels than between a thin and a thick vowel, and between consonants of like origin

[1] "Manual of Psychology" (1899), (p. 422).

(*e. g.*, dentals with dentals, labials with labials, linguals with linguals, etc.), rather than between consonants of divergent origin. In the case of such errors as the confusion of 'dis' and 'des,' the error is probably due to the similarity in sound, and to the prepotency of the 'd,' so that the vowel scarcely emerges (cf. also *a*ffect and *e*ffect). For examples of errors due to such similarity in sound, see Table XI.

Table XI.

List of Errors due to Similarity in Sound of Adjacent Letters, Word-parts, or Words.

Error.	*Correct Form.*	*Remarks.*
and let not them that are therein the countries enter into	and let not them that are in the countries enter into.	
philosophiker	philosophical thinker.	'k' = 'c' (hard).
we haven't any wat	we haven't any hot water.	'ot' = 'at.'
It will give father a Charles	It will give father a chance to pitch into Charles.	Note the common 'ch.'
pound-wise	penny- wise and pound-foolish.	Influence of alliteration.[1]
How do you keep your cleeth tean?	How do you keep your teeth clean?	'ee' = 'ea.'
Have you any of prose Poe's tale?	Have you any of Poe's prose tales?	'oe's' = 'ose.'
because everybody on	because everybody wants to move at once.	'wants' = 'once.' This was a graphic error.[2]
dollars and se	dollars and cents.....	Graphic error: 'c' (here) = 's'.[2]
On every side u	On every side of us.	'o' = 'u' (here).
American Tea and Company Coffee	American Tea and Coffee Company.	Note recurrence of 'Co.'

Eugraphic errors are also very numerous, especially in cases where one consonant or vowel is exchanged for, or continued into, another consonant or vowel which much resembles it in form (*e. g.*, 'a' and 'g,' 'a' and 'd,' 't' and 'd,' 'y' and 'p,' etc.). As has been seen above, in the discussion of the factors of verbal assimilation, graphic errors are also though with relative infrequency in most persons, due to auditory imagery.

[1] Cf. throughout the other tabulations for further examples of the influence of alliteration.

[2] For further graphic errors of this sort see Table IX.

These cases have been sufficiently commented upon. Cases of errors due to similarity of appearance of adjacent forms are as follows: When 'da' was written for 'dictation,' the error was doubtless facilitated by the juxtaposition to the vowels 'a' and 'i' of two letters of similar general formation (cf. the second and third strokes of the 'd' with the first two strokes of the 't'); so also when 'do' was written for 'due to.' For further examples see Table XII. In the formation of many of these abnormal forms the influence of the kinæsthetic imagery is often very strong.

TABLE XII.

List of Errors due to Similarity in Appearance of Adjacent Letters, Word-parts, or Words.

Error.	*Correct Form.*	*Remarks.*
da	dictation	Note the dentals, 'd' and 't.'
jud	justifying judgments.	
hav	habit	In the hand-writing 'v' and 'b' are formed much alike.
moality	modality	Ditto of 'a' and 'd.'
g	agreement	" " 'a' and 'g.'
aggrea	aggregation	" " 'a' and 'g.'
in reding	in reading	" " 'a' and 'd.'
availabe	available	" " 'e' and 'l.'
oxyden	oxygen	" " 'd' and 'g.'
thatt	that all	" " 'l' and 't.'
The Rio Grange	The Rio Grande	" " 'd' and 'g.'
embryolody	embryology	" " 'd' and 'g.'
orgain	or again	" " 'a' and 'g.'
Canda	Canada	" " 'a' and 'd.'
digram	diagram	" " 'a' and 'g.'
Chicgo	Chicago	" " 'a' and 'g.'
peadgogical	pedagogical	" " 'a' and 'd.'
if we ould	if we only could	" " 'n' and 'u.'
catchism	catechism	" " 'e' and 'c.'
by	but they	" " 'u' and 'y.'

The third principle is the common one that the most vivid and emotionally exciting forms tend to break up the habitual process and thus afford opportunity for errors. The principle is a familiar one that, other things being equal, that sensation complex will be longest remembered which is most vivid, frequent,

recent and emotionally congruous. The principle stated above is not an exception to this rule, but rather an application of it in the light of the correlative principle that that is most vivid and emotionally exciting which involves the most profound readjustment of existing habits. Hence, since errors tend to occur in the breaking up of such habits, they are the mark also of vivid and emotionally exciting experiences. A separate tabulation for such errors is obviously impossible, since there is no mark by which we are able objectively to indicate the effect of these affective characters, apart from the cognitive characters of which they are but an abstracted aspect. Reference may be made to the list of ludicrous errors tabulated below (Table XXXI.), which in many instances grew out of emotionally complex situations: see also the tabulation of examples of persistence.

On the basis of what is represented above as the tension between the purely automatic and the attentional processes, lapses are classifiable as illustrations either of persistence or of anticipation, according as the one or the other side of this total adjustment-process becomes prominent. By persistent forms are meant such as inhere in consciousness to the exclusion of incoming new ones. These with some reasonableness might be called Retrospections, a word which would correspond with Anticipations, except that this term would seem to suggest a conscious process—and conscious process moves forward only. Examples of oral literal persistence are as follows: 'ballot bax' was said for 'ballot box,' and 'peace-peap' for 'peace-pipe,' 'Swedish swinger' for 'Swedish singer,' and 'ice ouce on the bucket' for 'ice out on the bucket.' The following is an example of oral verbal persistence: 'a relationship not of fortuitous interrelationship' for 'a relationship not of fortuitous interdependence.' Graphic literal examples are 'ventral v' for 'ventral edge,' 'hydry' for hydra,' 'olf. fac' for 'olf. cavity,' 'bearing upon orthographical development in the de' for 'bearing upon orthographical development in the individual,' 'all concu' for 'all consumption of surplus-stored energy,' and 'eggs ten cents a dozen this weew only' for 'eggs ten cents a dozen this week only.' The following is an example of a ver-

bal graphic error: 'and Titchener; cf. Dewey's Titchener' for "and Titchener; cf. Dewey's use of the term 'feeling.'" For further examples of persistence see tables, below, of Ellipsis, Transposition, Substitution, etc. All cases of persistent substitution are, of course, examples of repetition also. What is already in consciousness tends to remain, in accordance with what has been called the law of possession (Stout's law of mental inertia).[1] This is essentially what occurs in the 'memory-after-image,' when, for example, "a knock at the door, the hour struck on the clock, the face of a friend whom we have passed unnoticed," is "recognized a few minutes later by means of the persisting image, although the actual impression was entirely disregarded."[2] Repetitions, in the case of lapses, consist simply in the repeating of a letter, word-part, or word (the pathological terms are paliniphrasia and palingraphia). Such errors frequently occur. Repetitions of phrases and words, or part of a compound word, are called reiterations.[3] Repetition of a single letter is called reduplication.[4] Reiteration and reduplication seem to be under purely reflex or automatic control. This is no doubt the reason why stammerers and stutterers, and blunderers (or clutterers), generally are so difficult of cure. Tautology and redundancy are but the rhetorical equivalents of this tendency. The most marked resemblance which appears upon a comparison of the phenomena of lapses and aphasia are the examples of persistence or repetition. For example, Stricker records the case of an aphasic patient who when the two objects, a knife and a book ('Messer' and 'Buch'), were held up before her, correctly identified and named 'Messer,' but called 'Buch' 'Besser."[5] Binet also points out that the suggestion of certain morbid states to the hypnotic patient leads to an exhaustion of the writing faculty, one of the first characteristics

[1] Anal. Psychol., I., p. 146.

[2] J. Ward, Art. 'Psychol.,' Enc. Brit., XX., p. 59.

[3] The following is an example: "Certain locomotor reflexes occur in the hind legs even after cross-section of the *hind legs*" for ". . . . even after cross-section of the *spinal cord.*"

[4] Examples of reduplication will be found in Table XIII.

[5] Sprachvorstellungen, p. 37–38; cf. also the case cited on p. 35, where 'Artrirarillerie' was spoken for 'Artillerie.' Cf. also M. A. Starr, Familiar Forms of Nervous Disease, p. 81.

of which is the tendency of the graphic characters to repetition.[1] The most striking cases of repetition in connection with lapses occur in the experimental errors. Table XIII. presents examples of these (all graphic); other examples will be found scattered throughout the other tabulations.

Table XIII.

Examples of Repetition in Graphic[2] Errors.

Error.	*Correct Form.*	*Remarks.*
temeporal	temporal	Auditory-manual : See methods of experimentation (above).
basiss	basis	do.
atttributes[3]	attributes	do.
in in	in	do.
possiblee[3]	possible	do.
certaim[4]	certain	do.
relationsns	relations	do.
conditiom	condition	do.
spacee[3]	space	do.
essentialley[3]	essentially.	do.
fixaation	fixation	do.
of the the man	of the man	do.
in number number	in number of vibrations	do.
the bodies of of a	the bodies of a	do.
grrave	grave	do.
severeral	several weeks	do.
flag flag	flag of red	do.
expeedition	expedition	do.
greeen[3]	green	do.
opinion opinion	opinion will	do.
alliterateration	alliteration	do.
meental[3]	mental	do.
in the the	in the number	do.
of like like	of like and opposite	do.
whiichi untes	which unites	do.
aleways[3]	always	do.
reaaches	reaches	do.
suiccessive[3]	successive	do.
thrrough	through	do.
exissts	exists	do.

[1] Le fétichisme dans l'amour, etc., Essay on L'écriture hystérique, p. 305. Cf. Stout also on the principle of repetition, Anal. Psychol., I., p. 263.

[2] Experimental.

[3] Facilitated by the likeness in the formation of the adjacent letters in handwriting.

[4] Many errors, involving parts of letters only, cannot be here tabulated.

prrcsssess	processes	Auditory-manual : See methods of experimentation (above).
asstate	a state.....	do.
fulfilleed[1]	fulfilled.....	do.
viiews viespecting[1]	views respecting.....	do.
back to Spa Spai	back to Spain	do.
compounds sso	compounds so.....	do.
uuually[1]	usually.....	do.
thee samee[1]	the same.....	do.
whose love liove	whose love is richer.....	do.
forgettting[1]	forgetting.....	do.
A compound may may may	A compound may.....	do
From the position of o the bodies it is thought tha exposition explos that	From the position of the bodies it is thought that the explosion was due.	do.
from its its	from its holy.....	do.
is is razed	is razed.....	do.
to Babylon Babbylont	to Babylon and there.....	do.
it is it is	it is without.....	do.
and and wi a	and without a.....	do.
rhythmical seriies	rhythmical series.....	do.
The rose is dead	The rose is red.....	In this error and the three which follow the *ead* had a peculiar insistency, doubtless facilitated by the like formation of *a* and *d*. The four errors were made in immediate succession while writing from dictation. In the last error the word 'red' was written correctly but only after considerable hesitation.
The rose is read	do.	
The rose is read	do.	
The rose is red (?)	do.	

The nature of anticipations is obvious. Frequently, especially in rapid or anxiously hurried writing or speaking, letters or words from the mental content of the as yet unwritten or unspoken sentence either displace others (otherwise yet to be expressed) or are actually inserted over and above what has already been expressed. These forms force their way in upon the page or lips by reason of (*a*) their intrinsic logical importance or interest in the connection, (*b*) their striking appearance in form, whether familiar or unfamiliar, (*c*) their strangeness or newness, the degree of attention required to recognize or ex-

[1] Facilitated by the likeness in the formation of the adjacent letters in handwriting.

cogitate (originate) them usually being greater in direct proportion to their unfamiliarity, (*d*) their moral or æsthetic weight or congruity in the connection, attention being the slave of the emotions, (*e*) their sheer length, the degree of attention requisite to hold them in consciousness until expressed being greater in proportion to their length, *ceteris paribus*. A given stroke or combination of strokes (in graphic) and a given sound or combination of sounds (in oral errors) often carry with them the idea of the-word-finished-up. When accordingly this stroke or sound is anticipated in consciousness before being precipitated in objective form, the meaning for which the stroke or sound is the symbol inhibits the production of further strokes or sounds, or alters their normal expression (cf. 'susceptibe' for 'susceptible'; this graphic error was made because the formation of the 'e' in handwriting is the same as the formation of 'l,' and the anticipated formation of such a letter-form carried with it the idea of the word as finished-up). Anticipations James explains as due to brain-processes beginning to be excited before "the thoughts attached to them are *due*—due, that is, in substantive and vivid form."[1] He says further, "In these cases one of two things must have happened: either some local accident of nutrition *blocks* the process that is *due*, so that other processes discharge that ought as yet to be but nascently aroused; or some opposite local accident *furthers* the *latter processes* and makes them explode before their time."[2] Examples of anticipatory lapses are very numerous. The following are examples of oral literal anticipations: 'To shut's one' for 'to shut one's,' and "How do you expell?" for "How do you spell 'extension?'" The following are graphic literal errors: 'Beaf-steak' for 'beef-steak,' and 'Harves Time' for 'Harvest Time.' The following are oral verbal anticipations: 'My weather' for 'My over-shoes will get all worn out if this weather continues,' and "We put to ship" for "We put to sea in a ship." The following are examples of graphic verbal anticipation: "Hearing is a time sense (space, a space sense)" for "Hearing is a time sense (vision, a space sense)"

[1] Principles of Psychology, I., p. 257.
[2] Ibid., p. 258; cf. also p. 564, 565, 567, 568.

and "The first chapter of the fifty-fifth chapter" for "The first verse of the fifty-fifth chapter." For further examples of anticipation, see tables below giving examples of anticipative ellipsis, transposition, substitution, etc.

Persistence and anticipation, as the terms are here used, are but another statement for habit and attention. Examples of persistence illustrate the tendency of habitual or automatic process to take up the activity of speaking or writing. Examples of anticipation illustrate the tendency of attention (where a readjustment is necessary) to break in upon this automatic process. In the case of persistence it is the unfamiliarity which occasions the error. Where no unfamiliarity occurs, no errors occur except those of anticipation or attention (those due to similarity). In the case of anticipative or attentional errors, it is the similarity of the two or more forms which occasions the errors (the error tending to fuse the similar elements into one). When there are no contiguous similars, no errors occur except those of persistence or habit (those due to unfamiliarity—the habitual process tending to usurp the function of expression). Thus from the side of attention (anticipation), the similar elements in the word or sentence tend to coalesce, and the unlike elements to be given correctly; while from the side of habit (persistence), the unfamiliar elements in the word or sentence tend to coalesce, and the familiar elements to be given correctly. As has been remarked before in another connection, language is the tool or instrument of thought. If in using a chisel or saw in carpentry the point breaks off or the teeth become dulled, the attention is directed from the work in which one is using the tools to the tools themselves; one swears at them, perhaps, or, better, attempts to sharpen them. So when one goes to the drug-store and asks for some 'Phosford's Acid Horsephate' and the clerk laughs at him, his attention is directed for the time being from the primary end he had in view, that of getting the medicine, to the words he has used as the means of procuring it. The experience goes on smoothly enough, in other words, until the means fail to fit the end, until the instrument or tool which we call language fails to do its work properly—when the necessity of some sort of a readjustment becomes apparent. That is

what is meant by saying that the lapse represents or *is* the break in the adjustment or coördinative process of experience. It is the point at which the preëxisting habitual line of activity fails to meet a new situation, or meets it in an inadequate way, this inadequacy finding expression, in the present instance, in the imperfect language forms. The following lapse brings out beautifully this vacillation between habit and attention, between persistence and anticipation, with the consequent error which resulted from the break in the process of readjustment. In attempting to write the passage 'costs a good deal' the person first incorrectly wrote 'god.' In correcting this, *d* was added (making 'godd'). Then, in confusion, the next word was begun with *g* instead of a *d* (making 'godd g'). Then, finally, a *d* was written over this *g* and *eal* was added, though with hesitation and a sense that "all the mental machinery had stopped working for the time being." Here the attentional or anticipated factor is the letter *d*, while the habitual or persisting factor is the letter *g*. The error, as a whole, represents the tension and finally the break in the process of readjustment with the attendant intensification of the subjective side of the situation and the precipitation of the erroneous forms. So-called *lapsus memoriæ*, in which the reinstatement or reproduction is partial only, illustrate best, perhaps, how the lapse grows out of an imperfect adjustment. Here, there is not only the production of an erroneous form (that is, one which is only partially correct), but there is, in addition, the consciousness that it is erroneous, which is not always the case with other forms of the lapse. In the following instances the first form gives the word correctly as it was attempted to recall it, while the second form gives the word as it was actually (in these cases partially) recalled. The psychological unit in these instances would be represented by the word-parts which are italicized: *Daven*port, *D*unr*aven:* Yucca, Poppy (here the idea of the double letter is what is common: Ac*cord*ian, Con*cord;* *B*rum*b*ack, *B* . . . *b* . . . (was sure only that there were two 'B's in that relation); *C*reos*o*te, *Cro*ton; P*en*field, Gl*en*hav*en;* Eu*pa*t*orium*, Se*ptorium;* B*one*set, St*ones; 623, 632; Mc*Nea*l, *Mc*Lea*n;* V*an*Kir*k*, H*an*coc*k; Mi*tchell, S*im*pson; C*oope*r*,* S*poone*r;*

TABLE XIV.

Examples of Errors due at once to Persistence and to Anticipation.

Error.	*Correct Form.*	*Remarks.*
still obiged	still obliged	Conversation
fraternal rations	fraternal relations	Reading aloud
when the war with Fance	when the war with France broke out.	do.
a loud soud	a loud sound is suddenly heard.	do.
Chapel, Cobbel	Chapel, Cobb Hall	Conversation
continues to exists	continues to exist, its manifestations.	do.
and de	and ascended into heaven.	Reading aloud
It is at least too early to afform	It is at least too early to affirm that gold monometalism has won.	do.
some half-mile around to my three-fôld	some half-mile around to my three-fold cord.	do.
September, said the tecretary	September, said the secretary.	do.
Mister Briswood	Mister Brithwood is busy...	do.
see Thayer, page thix	see Thayer, page six, thirty-six.	do.
definite outfet	definite outfit of reflexes....	do.
lest my lord by	lest my lord be too much troubled by effrontery.	do.
pleasureable or plainful	pleasureable or painful element.	do.
stored norvous	stored nervous force.....	do.
pays more attention to religion	pays more attention to religious instruction.	do.
which he placed in the window nook, and then returned to the book	which he placed in the window nook, and then returned to the bed and took.	do.
and his houl	and his soul can hardly contain.	do.
decrepid, decrayed	decrepit, decayed, crazy...	do.
Ruskin and Morris mem	Ruskin and Morris remedy.	do.
never slowed the shightest sign	never showed the slightest sign.	do.
which he whiches	which he wishes.....	Graphic (for other cases see Graphic exchanges, below)
looseless	looseness of his own language.	Graphic
sometime makes	sometimes make mistakes.	Conversation
eyes and mouths	eyes and mouth and cheeks.	do.

H*obb*ouse, C*obb*ead; S*artor* Res*art*us; T*artar*us; Loc*ke*, Clar*ke;* P*assey*, S*appey;* Dey*ber*, P*er*gens; *125,215*. Other examples which bring out the influence both of persistence and of anticipation, in the same error, are grouped in Table XIV. Still further examples will be found in the tabulation, below, of oral and graphic exchanges.

Conflict and Coalescence.—Mr. G. F. Stout uses the term 'coalescence' (previously used by Hartley and others) to express that process of association in which one percept assimilates to another percept or to a mental predisposition left by previous percepts.[1] According to this conception, the process of coalescence or 'overlapping' is the resultant of a process of conflict or competition of part-processes. Coalescence or overlapping may take either of two typical forms according as it involves merely a displacement or omission with a substitution, or a coalition with modification of the elements involved. The simpler is the case in which one element simply drives out another and takes its place; this we have called coalescence by substitution. Of this type of coalescence Mr. Stout says, "It may happen that under conditions which would otherwise give rise to conflict, no appreciable conflict actually ensues, simply because either the old or the new combination is relatively so powerful as to overbear the tendency opposed to it without a struggle. Suppose the components of the one combination are *a b c*, and of the other *a b x; c* may be so favored from the outset that it simply displaces *x* without any feeling of discrepancy arising, and without any attention to the difference. This process I call *overlapping* or *coalescence*."[2] He further remarks that when this happens, it may also extend to the corresponding memory-image, inasmuch as the modified perception gives rise to a correspondingly modified idea. It extends also to mental images, apart from their interaction with percepts, as clearly illustrated in his series of illustrations.[3] The most striking examples of coalescence are those in which the overlapping is one-sided. This is shown in the examples cited by Mr. Stout—in 'our

[1] Analytic Psychology, I., p. 286.
[2] P. 285.
[3] Pp. 286–289.

views of what *ought* to have taken place,' in the case of 'men who come to credit their own lies by frequent repetition of them,' in that fiction which is only *founded* on fact, in that condition of being 'haunted by a general sense of having done something or experienced something before.' These are chiefly examples of coalescence between mental images. Examples of the 'falsification of perception through the blending of an image with a more or less divergent percept' are noted as of 'very common occurrence.' But certainly as numerous are the cases in which two percepts appear to be concerned, as when, for example, two words being pronounced in rapid succession or seen simultaneously, the result is a hybrid or coalescent form. There are thus three types of coalescence—cases in which are involved (1) two (or more) percepts—for the most part peripherally excited, (2) an image and a percept—in part peripherally and in part centrally excited, (3) two (or more) images—for the most part centrally excited. Examples of these three classes are here appended. As examples of the coalescence of two percepts, the following are instructive: 'surval' was read aloud for 'survival value,' 'these penal enlargements' for "these penal establishments were enlarged,' 'that's a perison' for 'that's a period for comparison.' The following are examples of the coalescence of a percept with an image or idea. While attempting to compose a sentence in which it was desired to use the expression, 'the Good Shepherd,' another person who was delivering a lecture uttered a sentence in which occurred the word 'subject'; this apparently caused the error in writing, which became 'the Good subject.' In a similar way 'punish-man' was written for 'punishment,' the word 'man' being uttered just as the word 'punishment' was being written. So, again, intending to write the phrase 'power of contrary choice,' and the word 'constraint' being uttered by another person just as the word 'contrary' was about to be written, the resultant coalescent form became 'power of constraint.' The following are examples of the coalescence of two mental images or ideas. They were caused in almost every case by hesitation in the choice of terms or expressions (especially synonyms). The synonyms, 'differences' and 'disagreements,' being in mind,

and each struggling for utterance, the resulting coalescent form was 'degreements.' In a similar way resulted 'whotailing' from a confusion and fusion of 'retailing' and 'wholesale,' 'carbohydron' from 'hydrocarbon' and 'carbohydrate,' 'rudiculous' from 'ridiculous and 'ludicrous,' 'symblem' from 'symbol' and 'emblem,' 'atmosphair' from 'atmosphere' and 'air.' A clerk in the mechanical department of a Railroad Company made out a pass for an employee, while his mind was engrossed in the shipping of cylinders; what he wrote was 'Lima to Cylinder' for 'Lima to Dayton.' Replacing a photograph, which had just fallen upon the floor, and speaking of a key which had been lost, one person said, 'I gave the photograph' instead of 'I gave the key.' A professor wrote 'iron alum 4' instead of 'iron alum formalin, 8 days,' (he was suffering intense pain at the time). Another person while studying the general subject of 'sensation,' went to the dictionary to look up the word 'inhibit' and turned the pages of the dictionary to 'sen....' A similar error was made in looking up the word 'substitution,' the person looking under 'b' instead of 's.' So, again, intending to turn to 'abschliessen' in the lexicon, a student turned to 'as' instead of 'ab,' and wondered why he failed to find the word. Another person went to the dictionary for 'scope,' and turned to 'c,' and was perplexed that the dictionary did not contain that word. Instances might be multiplied indefinitely. Further illustrations will be found in Tables II., III., and IV.

Coalescence by substitution may take any one or more of three forms: (1) ellipsis, (2) transposition, (3) substitution proper. Ellipsis and transposition usually go together. An *ellipsis* is the omission or dropping of a letter, word-part, or word (or even of a group of words). When literal, ellipsis is called elision; elision most frequently occurs in the case when a word begins with the same letter with which the preceding word ends.[1] The following is an example of the ellipsis of an entire word: 'Moral and separation' was spoken for 'moral and spiritual separation.' Probably the common initial consonant, 's,' facilitated the error. The following is an example of

[1] Cf. the scanning of Latin verse.

the graphic ellipis of an entire word: "As I had to wait some, I saw some baby-hoods" for "As I had to wait some ten minutes,

TABLE XV.

Ellipsis due to the Sense of having Written the Letter, Word-part of Word.

Error.	*Correct Form.*	*Remarks.*
sudden dawing	sudden dawning	Letter-writing
has much	has as much	Composition
grief that gazes at a gave	grief that gazes at a grave.	Copying[1]
preacher but	preacher here but	do.
are lated	are related	do.
process shows	processes shows	do.
have not abitually	have not habitually	Composition
is is	is his	do.
forms of nervous nisease	forms of nervous disease	Dictation
elemets	elements	Copying[2]
accout	account.	do.
Phla	Philadelphia	do.
is requred	is required	do.
are sone	are some	do.
may	many	do.
sonetimes	sometimes	do.
tenple	temple	do.
hone	home	do.
Phlippines	Philippines	do.
tured	turned	do.
then	them	do.
cone	come	do.
infinte	infinite	do.
Colunbus	Columbus	do.
anythng	anything	do.
nuber	number	do.
Span	Spain	do.
qute	quite	do.
pont	point	do.
sonething	something	do.
sustances	substances	do.

[1] This and the errors that follow are experimental errors.

[2] In the errors that follow it must be remembered that the formation (in hand-writing) of many letters, such as u, n, m, third and fourth strokes of h, first and second strokes of y, the formation of the letter i, and the last two strokes of the letter p, etc., is essentially identical. Many errors involving parts of letters, only, are omitted from this table, simply from lack of typographical representations for them. They will receive attention in the study from the genetic standpoint.

TABLE XVI.

Ellipsis Due to Previous Pronunciation of the Same Letter, Word-part, or Word.

Error.	*Correct Form.*	*Remarks.*	
It takes one breath	It takes one's breath away	Conversation	
heights of ate	heights of hate	do.	
much less pecialized	much less specialized.....	do.	
Anemone, sails, etc.	Anemone, snails, etc.	Reading aloud	
I think I'll strike off that edge	I think I'll strike off that sedge.....	do.	
in raising bead	in raising bread.....	do.	
trickled the eardrops	trickled the teardrops.....	do.	
truly normous	truly enormous.....	do.	'y' = 'e'
as water runs off a duck back	as water runs off a duck's back	Conversation	
very good rounds	very good grounds.....	Platform address	
at the tribunal of penance that the piests	at the tribunal of penance that the priests endeavored.....	Reading aloud	

I saw some baby-hoods." 'Truly normous' for 'Truly enormous,' and 'my thy' for 'may thy' are oral examples of the ellipsis of single letters (in the one case, of an initial, and in the other case of an intermediate letter); 'has much' for 'has as much' and 'process shows' for 'processes shows' are graphic examples. An interesting case of habitual elision is the following, which is given in the words of the person who reported it. "J. S., an Englishman of, say, nearly thirty years, entered the D. U. Preparatory Department to study for the ministry. By dint of great effort he had conquered his 'h's and almost invariably spoke them correctly. 'Wh,' however, he often pronounced like 'w.' In his Greek he had the greatest trouble with his rough breathings. In his pronunciation he habitually omitted them and at times would write them smooth. This difficulty continued for at least two years study of the language." Here, plainly, a deeply ingrained habit came into conflict with the attempted acquisition of new forms through the attention, and resulted in the frequent making of errors. Many unaccountable cases of ellipsis occur, such as the following: 'Shoud' for 'should that not be,' 'separale' for, 'separable,' 'develoment' for 'development,' 'receivd' for 'received,' 'in Boton' for 'in Boston,' 'pro of physical' for 'product of physical,'

TABLE XVII.

Graphic Ellipsis Due to the Anticipation of Letters, Word-parts, or Words.

Error.	*Correct Form.*	*Remarks.*
may bet	may be set	Copying
ethica life	ethical life	Composition
pround	profound	Letter-writing
I think it would be a good i to p	I think it will be a good idea to keep this handy	Copying
a series f	a series of fault lines	do.
antitheptic	antipathetic	do.
quote C. L. Here	quote C. L. H. here	Composition: the person's name was C. L. Herrick.
stan outs	stands out	Copying
it is onderful	it is wonderful what	Composition
w egree	we agree	do.
mak out	make out	do.
wh	we have	do.
samy	same way	do.
of they	of the eye	Copying
in reding	in reading	do.
rember	remember	do.
with word	within work	Composition
indepent	independent	do.
liker	like her	do.
opposides	opposite sides	do.
rembran	remembrance	do.
at leas three	at least three	Copying
from this task	from this to ask	do.
se–a	sea-anemones	do.
what matters	what matter is	do.
base upond	based upon	do.
extrado	extraordinary	Composition
effor to	effort to	do.
whe	when he	do.
buth	but that	Letter-writing
are qually	are equally	Composition
while it	while yet it	do.
dication	dictation	do.
by an dir	by an indirect	do.
no w	now we	do.
quari	quadilateral	do.
is obj	is open to objection	do.
even isists	even insists	do.
in tensity	in intensity	do.

'compresive' for 'comprehensive,' 'succesive' for 'successive,' 'consciousnss' for 'consciousness.' In Tables XV., XVI., XVII. and XVIII. examples of ellipsis are classified by two principles of division (1) whether oral or graphic, (2) whether illustrations of persistence or of anticipation.

Table XVIII.

Oral Ellipsis due to Anticipation of Letters, Word-parts, or Words.

Error.	*Correct Form.*	*Remarks.*	
down where the apple-ossoms blow	down where the apple blossoms grow.....	Conversation	
chronic	chronicle political.....	Reading aloud	
too ull for utterance.	too full for utterance.....	Conversation	
fed	fled for refuge.....	do.	
iea	idea	do.	
only in the pecific.	only in the specific	do.	's' = 'c
well, three or fours of this	well, three or four years of this.....	Reading aloud	
rentless	relentless.....	do.	
rembled	resembled	Conversation	
Protestism	Protestantism.....	Reading aloud	
repess	repress it.....	Conversation	
and ed	and end-bud	do.	
witten	written word.....	do.	
call	small cymose.....	do.	'c' as in 'cy'
The chairman rose in his pace	The chairman rose in his place, pale and agitated	Reading aloud	
low oesophagus	lower oesophagus.....	do.	
proc of	process of	do.	'c' as in 'process'
when the formances	when the performances.....	Reading aloud	
Linus utas	Linus usitatissimum	do.	
save as thou teach us	save as thou teachest us	do.	
and my thy	and may thy.....	do.	
each dividual	each individual	do.	
the 'sgock	the clock's got.....	Conversation	
covetness	coveteousness.....	do.	
develoment	development	do.	
I believed her balone	I believed her to be alone..	do.	
A public peaker	A public speaker said	Reading *sotto voce*	

By a *transposition* is meant the displacement of a letter, word-part, or word without any complementary substitution or

TABLE XIX.

Examples of Graphic Persistent Transposition.

Error.	*Correct Form.*	*Remarks.*
classed hered	classed here	Copying
glimplse	glimpse of Pike's Peak	do.
an auditory nage	an auditory age	do.
whol whold	who hold	do.
when whe	when we	do.
haste to to	haste to	do.
courses to to pursue	courses to pursue	do.
as at at	as at	do.
to the to the	to the	do.
she shays	she says	do.
trademans	tradesman	do.
h fore	h for it	'h' here was an abbreviation for 'have'; the 'e' came from the suppressed 'ave.'
1885	185	Copying
to o	to return	do.

TABLE XX.

Examples of Oral Persistent Transposition.

Error.	*Correct Form.*	*Remarks.*
Hawaii and Helsewhere	Hawaii and elsewhere	Conversation
subsididary	subsidiary	do.
I must to Paris, he gasbped	I must to Paris, he gasped.	Reading aloud; the 'h' of 'he' is transplaced.
afford a mans	affords a man	Reading aloud
mile distants	miles distant	do.
at flourish of the blade the crowd stood black.	at flourish of the blade the crowd stood back.	do.
cheek looks	cheeks look	do.
sometime makes	sometimes make	do.
suddenly risening	suddenly rising	do.
changed muched	changed much	do.
cost of dresst	cost of dress	do.
grin agrain	grin again	do.
intellect, affections, and moral earnestness in these respections.	intellect, affections, and moral earnestness in these respects.	do.
eternal sherdes	eternal shades	do.
appliclation	application	do.
blue blood black	blue blood back to the Normans	do.
est-negg	nest-egg	do.
Give me a spoon out of the tumbler before Tubbly gets it.	Give me a spoon out of the tumbler before Tubby gets it.	do.

exchange. A transposition may, indeed, be viewed as an arrested substitution. A transposition may be either persistent (repetition) or anticipatory, and accompanied by an ellipsis or not so accompanied. They are distinguished from what we have called Insertions in that they have always some obvious persistent or anticipative cause. The following is an example of persistent transposition accompanied by an elision: 'Ith or win' was spoken for 'with or in.' 'Alto solto' spoken for 'Alto solo' is an example of persistent transposition which is unaccompanied by elision; this is an example also of repetition. "The juicey" spoken for "The juice is milky" is an example of anticipatory transposition. These are all oral examples.

Table XXI.

Examples of Graphic Anticipatory Transposition.

Error.	*Correct Form.*	*Remarks.*
I smade	I made a start.....	Copying
anybodyd else	anybody else would.....	do.
Good	God by nature good.....	do.
boilded	boiled dinner.....	do.
borards	boards.....	do.
tell hus	tell us here.....	do.
plublic	public	do.
fundamental anthithesis	fundamental antithesis.....	do.
regarding the two ha	regarding the two as homodynamous.	do.
laspsed	lapsed.....	do.
maglignant	malignant.....	do.
ase	as are.....	do.
distuing	distinguished.....	do.
one	on the.....	do.
womand	woman and.....	do.
yout can't	you can't.....	do.
mend	men and.....	do.
manisf	manifestation	do.
havep been	have been prepared.....	do.
withoubt	without doubt.....	do.
mut	utmost.....	do.
shpheres	spheres.....	do.
fromed	from that of hoofed Herbivora.	do.
ell cells	air cells.....	do.
frome	from the.....	do.
we see hin	we seen in him.....	do.
nod e	no education.....	do.

Graphic errors of the same sort are abundant. For the tabulation of transpositions see Tables XIX., XX., XXI., and XXII. Obviously, since persistent transpositions are largely repetitions Table XIX. will cover in part the same ground as Table XIII. (see above); but in the latter case the errors tabulated are all

TABLE XXII.

Examples of Oral Anticipatory Transposition.

Error.	*Correct Form.*	*Remarks.*
Fetch the box at onced	Fetch the box at once as she has promised....	Reading aloud
subjective universality	subjective universal validity.	do.
brings inward	bring inwards.....	do.
nerver fi	nerve fibers.....	do.
and ang as the birds sing on its bough	and sang as the bird sings on its bough.	do.
old mens	old men are always fables..	do.
a violent Equinoctial sgale	a violent Equinoctial gale supervened.	do.
I say the sfear	I say the fear should fall....	do.
gives one	give ones.....	do.
highly	high-priestly.....	do.
the bloods	the blood of bulls and goats	do.
organisism	organism consists.....	do.
larish	lashing furiously.....	do.
as much as impo	as much as possible the grand impression.	do.
setle of idle	set of idle.....	do.
Motherly in Enderly	Mother in Enderly.....	do.
on the divast	on the vast diversity.....	do.
danger's	danger there's.....	Conversation
to shut's one	to shut one's eyes.....	do.
his flace	his face was a play-ground	do.
finely	fine closely.....	do.
planes	panes of glass.....	do.
leather stel	leather telescope.....	do.
a bright flire	a bright fire blazing.....	do.
with tonguer	with tongue asunder.....	do.
a new atroop	a new troop assembles.....	do.
snappering	snapping the numerous bonds.	do.
earnest	earn an honest living.....	do.
There is onet for rent	There is one for rent.....	do.
plain	pain, pleasure, and æsthetics.	do.
Decorations day	Decoration days.....	do.
The Brible bings	The Bible brings.....	do.

experimental, whereas in the present instance they are errors made in ordinary writing.

Substitutions proper are errors in which one letter, word-part or word, by either persistence or anticipation, takes the place of another such letter, word-part or word. In some

Table XXIII.

Graphic Persistent Substitutions.

Of Letters or Word-parts.

Error.	*Correct Form.*	*Remarks.*
Mr. W. Blair Clair	Mr. W. Blair Clark	Composition
are are	are all	do.
The leader blind and led by the land	The leader blind and led by the hand.	do.
if it it	if it is	do.
to prove to	to prove who so	do.
felling	feeling	'e' = 'l.'
paradax	paradox	
I want to sell three hundree	I want to sell three hundred acres.	Copying
independent dissue	independent tissue	Composition
He who runs away may live to see another way	He who runs away may live to see another day.	do.
beef-steaf	beef-steak	do.
metaphysical physic	metaphysical psychology	do.
conception of dution	conception of duty	Copying

Of Words.

Error.	*Correct Form.*	*Remarks.*
each set of questions when they are set	each set of questions when they are sent.	Composition
intuitions of men of	intuition of men are	do.
Mrs. S. R. Jones, Mrs. S. R. Beeman	Mrs. S. R. Jones, Mrs. H. N. Beeman.	do.
one of my one	one of my own	do.
conflict and morbid conflict	conflict and morbid conscience.	Dictation
absent-minded man at the mind	absent-minded man at the moment.	do.
two two	two-toed cloth	Copying
rapidity with with	rapidity with which	Composition
how much dusting you much have done	how much dusting you must have done.	do.
the room, so we home to get	the room, so we hope to get.	do.
make the assertion that self assertion	make the assertion that self realization.	Copying

TABLE XXIV.

Oral Persistent Substitutions.

OF LETTERS OR WORD-PARTS.

Error.	*Correct Form.*	*Remarks.*
I have kept the faith ; I have fought the good fith	I have kept the faith ; I have fought the good fight.	Reading aloud
optic tup	optic cup	Conversation
six theal	sixth seal	do.
tertium tuid	tertium quid	do.
on the first bed though in a lions ded	on the first bed, though in a lion's den.	Reading aloud
if we admid	if we admit	Conversation
bent on blowing bib	bent on blowing big	do.
so he will so	so he will say	do.
tidal wive	tidal wave	do.
opponents opp	opponents apparently	do.
loosley foo	loosley few-flowered	do.
Those who believe in evolution think that revolution	Those who believe in evoltion think that revelation.	do.
refinement, gentlement	refinement, gentleness	do.
as if he had dashed it on hit or mish	as if he had dashed it on hit or miss.	do.
than the nest to the nedgling	than the nest to the fledgling.	do.
this joint-sent test	this joint-sense test	do.
baked bans	baked beans	do.
on the necessity of ne-generation.	on the necessity of re-generation.	do.
secluded retruts	secluded retreats	do.
Herbertian	Herbartian	do.
indesdribable	indescribable	do.

OF WORDS.

Error.	*Correct Form.*	*Remarks.*
How many bushels do you think he lost in eight bushels of coal?	How many bushels do you think he lost in eight wagon-loads of coal.	Conversation
Mr. S. wishes his mail put in his box	M. S. wishes his mail put in my box.	do.
If I only had more milk I would take that other piece of milk	If I only had more milk I would take that other piece of cake.	do.
It usually appears on the seventh or eighth day; yet in some days.	It usually appears on the seventh or eighth day; yet in some cases.	do.
parentheis is parenthesis	parenthesis is adhered to	do.
sight represented by sight	sight represented by one	do.

cases where the substitution is mutual (exchanges) the whole word or phrase may be considered as the psychological unit, in which case the errors fall within a subsequent category (coalescence by modification). We speak of an elision when there is simply a part of the expression left out. We speak of a transposition when there is something (taken from some other part of the expression) added to the complete word or sentence. We speak of a substitution when something is put in place of part of the word or sentence. All errors are really substitutions, using the word in a broad sense. But the term is restricted here to the sense just defined. It is noticeable that the number of partial or uncompleted errors, such as transpositions

TABLE XXV.

Graphic Anticipatory Substitutions.

OF LETTERS OR WORD-PARTS.

Error.	*Correct Form.*	*Remarks.*
The whole error of c	The whole error of Kant can be.....	Copying
ar	or as	Composition
no	know nothing.....	do.
he head	the head.....	do.
de	adequately.....	do.
I h	I shall have.....	do.
rhape	shape, roughness.....	do.
et	entirely.....	do.
blanch	branch quite black.....	do.
ang	and got.....	do.
all	as well	do.
if	it off	do.
shes	she has.....	do.
by	be my.	do.
cout	cut out.....	do.
proppit	propped it.....	do.
return Eand	return East and.....	do.
searth	search for truth.....	do.
af	as if.....	do.
bug	begun on.....	do.
concrea	concrete realities.....	Copying
pieches	pieces of machinery.....	Dictation
host	historical.....	Copying
in the outf	in the outward form.....	do.
grach	graphic characters	Composition
rad	rapidly.....	do.

OF WORDS.

Error.	*Correct Form.*	*Remarks.*
I stand reason	I stand ready to make large sacrifice on behalf of the kingdom, where I see a reason for such sacrifice.	Composition
means in end	means in mind and end in view.....	Dictation
made of	made up of	Composition
The first chapter of the fifty-fifth chapter	The first verse of the fifty-fifth chapter	do.
Hearing is a time-sense (space, a space-sense.)	Hearing is a time-sense (vision a space-sense)	do.
interpretation to	interpretation due to.....	do.

and substitutions, greatly exceeds that of completed errors, such as exchanges. This is due to the fact that they are often recognized before they have been fully carried out, the incorrectness or strangeness of the expression calling attention to them. The following are examples of persistent substitution: 'Müller and H. Müller' was written for 'Müller and H. Weber,' 'superficial superficial' was written for 'superficial appearances.' The following are anticipative substitutions: 'ball and joc' was spoken for 'ball and socket joint,' 'Put plustard' was spoken for 'Put mustard and flour in the plaster.' Further examples will be found in Tables XXIII., XXIV., XXV. and XXVI.

TABLE XXVI.

Oral Anticipatory Substitutions.

OF LETTERS OR WORD-PARTS.

Error.	*Correct Form.*	*Remarks.*
extornal	external organization.....	Conversation
partakin	partaken in.....	do.
the prid	the proud titles.....	Reading aloud
between filling	between feeling and willing	do.
collooding	colliding on the loop.....	Conversation
high-praced	high-priced places.....	do.
ter	tireless energy.....	Lecture
simular	similar incubus.....	Reading aloud
spice	space and time.....	do.
remoun	remain profoundly.....	do.
benoth	beneath those.....	do.
sa	so may.....	do.

divinely appint	divinely appointed advisor.	Pulpit utterance
kets	pots and kettles.....	Conversation
accustim	accustom him.....	do.
spouted	spotted trout.....	do.
no occusion	no occasion for a bugle.....	do.
applosive	applausive Rome.....	Reading aloud
befur	before the bifurcation.....	do.
escup	escaped its clutches.....	do.
ice-borgs	ice-bergs are formed.....	do.
overthrou	overthrow of Louis XIV..	do.
imitet	imitating perfections.....	do.
humin	human interest.....	do.
a bast	a vast battlefield.....	do.
chrimitive	primitive Christians.....	do.

OF WORDS.

Error.	*Correct Form.*	*Remarks.*
expersons	expert persons..	Conversation
He shall judge the right	He shall judge the people righteously.	Public reading
to members	to remember in such an important connection the members.	do.
the buseful	the beautiful is as useful....	do.
forge like two	beat like two forge hammers.	do.
Jael took her into her private apartments	Jael took him into her private apartments.	Reading aloud
Put down your mouth	Put down your ear to my mouth.	Conversation
It's funny how this present	It's funny how this smell is everywhere present.	do.
which he said he would not hear	which he said he would not want to hear.	do.
tropic of Cancercorn	tropic of Capricorn and of Cancer.	do.
cook house	cook meals and keep house.	do.
anywhere	anyone where.....	do.
Put my coat in your pocket	Put my cup in your coat-pocket.	do.
I bought three dollars	I bought my dress for three dollars.	do.
even through	even so through.....	do.
The strength of the people	The strength of the Church is in the Christian people.	do.
Carried his mouth into his bosom	carried his hand into his bosom and thence to his mouth.	do.
Mrs. eyes	Mrs. Bingham's eyes.....	do.

The other form of coalescence is the case in which two elements combine into one by modification and coalition, forming a hybrid. What are called exchanges may be regarded as belonging here, when (as is usually the case) the whole word or passage involved is to be taken as the psychological unit. Of this type of coalescence Mr. Stout seems to give no distinct

TABLE XXVII.

Graphic Examples of Coalescence which Involves the Modification of a Vowel or Consonant.

Error.	*Correct Form.*	*Remarks.*
and god	and got	Crossed the 'd.'
independent dissue	independent tissue	do.
nevey	never ceasing	The last letter of 'nevey' had characters which partook partly of the 'y' and partly of the 'g.'
descriping	describing	Ditto of 'p' and 'b.'
loke	love and hate	
multijll	multiplicity	Formed a hybrid of the 'p' and 'l,' which can be here represented only by 'j.'
Egyj[1]	Egypt	Ditto of 'p' and 't.'
ainder	are under	The 'a' and 'u' were run together: this can be represented here only by 'i.'
sonee	are some	The third stroke of the 'm' was made into an 'e.'
Gefülle	Gefühle	'h' was modified into 'l.'
say	saw	The 'w' had a descending loop added to it.
chiel	child	'l' was modified into 'e.'
ofjective	objective	The 'b' had a descending loop added to it.

treatment. It would seem that he had in mind only, or chiefly, examples of what we have called coalescence by substitution. The word 'coalescence' certainly may be restricted to cases such as these, though it would appear that the word 'overlapping' would have been a better term if a distinction were to be made, reserving the term 'coalescence' strictly for cases of coalition by modification. We prefer, however, to retain Mr. Stout's term, using it in the more general sense as covering all cases in which

[1] This and those which follow are experimental errors.

either substitution or modification takes place. Coalescence would perhaps be equally well described by such terms as fusion, assimilation, coalition, reinforcement, modification; but Professor Stout's able discussion of the general phenomena here under consideration has given a certain definiteness of content to the word 'coalescence' from which it does not seem well to depart by the multiplication of terms. Common examples of modification occur in the learning of a new language, for instance in the imperfect pronunciation of English by foreigners, when, *e. g.*, they say 'zey' for 'they,' 'ze' for 'the,' 'vas' for 'what,' 'vone' for 'one,' 'zis' for 'this,' 'zat' for 'that,' 'zem' for 'them,' etc. Examples of coalescence by modification are found also in those cases where the pure word idea (*e. g.*, in reading a for-

Table XXVIII.

Oral Examples of Coalescence which Involve the Modification of a Vowel or Consonant.

Error.	*Correct Form.*	*Remarks.*
our corkey	our turkey was cooking....	The 'o' in 'corkey' was pronounced as in 'cork.'
The Wêst	The East Indies or West...	The 'e' in 'West' was pronounced as in 'fête.'
Bely Attden	Betty Alden.....	The 'd' and the 'tt' were run together.
by-strāāts	by-streets known only to Simon.....	The vowel-sound in 'strāāts' was pronounced as in 'rays'
vergant pastoors	verdant pastures.....	The coalescence resulted in the modification of the 'u' into an 'oo' sound.
extêrior tintacles	exterior tentacles.....	The coalescence resulted in the modification of the 'ē' of 'exterior' into 'ê' (as in 'ten') and of the 'ê' of 'tentacles' into 'i' (as in 'tin.')
ignēma	enigma.....	The 'e' was pronounced as in 'anēmic.'
simping	sinking ship.....	The 'p' was anticipated, and the 'm' substituted for 'n,' 'np' being unpronounceable.

TABLE XXIX.

Examples of Graphic Exchange.

WITHIN THE WORD.

Error.	*Correct Form.*	*Remarks.*
bibilography	bibliography	Composition.
sucidie	suicide	do.
ear	era	do.
gential	genital	do.
viogr	vigor	do.
form	from	do.
ebliever	believer	do.
dulaistic	dualistic	do.
scrace	scarce	do.
recokning	reckoning	do.
exictory	excitory	do.
cyldiner	cylinder	do.
olfacort	olfactories	do.
Charlottwon	Charlottown	do.
pead	pedagogy	do.
detial	detail	do.
roost	roots	do.
Montog	Montgomery	do.
anidequate	inadequate.	do.
tup	put	do.
speficic	specific	do.
regural	regular	do.
next spet in develop	next step in development.	do.
slain	snail	do.
excatition	excitation	do.
helioprotioprotism	heliotropism	do.
dise	side	do.
sdie	side	do.
Corcondat	Concordat of Worms	do.
intellecutal	intellectual	do.
Neadenr	Neander	do.
reap	repeating	do.
ser	reservation	do.
obth	both	do.

INVOLVING TWO OR MORE WORDS.

ate rany	any rate	do.
id dit	it did	do.
no dot	do not	do.
so n	no subconscious	do.
dee sict	see dictionary	do.
If I no d	If I do not	do.
Leo-N	Neo-Lamarckians	do.
are so arranged	are arranged so	do.

eign language) becomes modified in accord with some meaning-idea, which nevertheless is recognized as irrelevant. This gives rise to a great part of the ludicrous mistakes made by beginners in the study of a foreign language (which uses the same form of language symbols). Examples of vowel and consonant modification in lapses are exhibited in Tables XXVII. and XXVIII.

Then there are the errors alluded to above, *exchanges*, in which the psychological unit of speech or writing is altered in some way from the usual or normal form; this includes errors which vary from what are here called inversions to exchanges which involve even groups of words. An exchange is the reciprocal substitution of letters, word-parts, words, or groups of words. That is, they may occur within the word or take place between two words or groups of words. They are chiefly oral and anticipatory, because, writing being slower than speech with most persons, the error in the latter case is not allowed to reach this relatively complex form. Exchanges of consecutive forms are called inversions. "The hang wires loose," "The air's roomed out," "I don't feel a good bit," "My thins are sole," "They saved the last till the best," "Put the pot on the cover," "Put some stove in the coal," are examples of verbal exchanges. 'The two-sloed toth,' 'five-gollar dold-piece,' 'blush a brue coat,' 'that thy lays may be dong in the land which the Lord thy God giveth thee' are examples of literal exchanges. Tables XXIX. and XXX. furnish further instances.

Table XXX.

Examples of Oral Exchange.

Within the Word.

Error.	*Correct Form.*	*Remarks.*
trenscandent[1]	transcendent	Public speaking.
plotoprasm	protoplasm	Conversation.
intripedity	intrepidity	Reading aloud.
Conolian	Colonial	Conversation.
ennaxation	annexation	do.
donimoes	dominoes	do.
chulfeerness	cheerfulness	do.
direlect	derelict	Reading aloud.
orren	erroneous	do.
knacksap	knapsack	do.

wist	wits	Conversation
Itanial	Italian	Reading aloud
Cenilli	Cellini	do.
regural	regular	Conversation
revelant	relevant	do.
municifent	munificent	do.
Colyparp	Polycarp	do.
codemy	comedy	do.
evelate	elevate	do.
homeogenous	homogeneous	do.
disintregation	disintegration	do.
pom	compact	do.
standsone	sandstone	do.
pretesdin	predestinates	do.
coborrative	corroborative	do.
desuctive	seductive	do.
palarerrogram	parallelogram	do.
flutterby	butterfly	do.
Swegenbordian	Swedenborgian	do.
hyptonized	Hypnotized	do.

INVOLVING LETTERS, OR WORD-PARTS, IN THE CASE OF TWO OR MORE WORDS.

thick quinkly[2]	think quickly	do.
the clack's trear	the track's clear	do.
make a noyful joise	make a joyful noise unto the Lord.	Public reading
beth mesod	best method	Conversation
a jog-lammed creek	a log-jammed creek	Reading aloud
paly curte	curly pate	Conversation
What kind of a weel has Whill got?	What kind of a wheel has Will got?	do.
This is bad weatter for buther	This is bad weather for butter.	do.
You'd metter bake[1]	You'd better make a business of it	do.
Baby is stough and trong	Baby is tough and strong	do.
thight brought	bright thought	do.
fauld fount	found fault	do.
blings gradness	brings gladness	do.
dur-nayses	day-nurses	do.
The rabbits went hipping and skopping	The rabbits went skipping and hopping.	do.
reats are rool	roots are real	Reading aloud
slamefully shandered	shamefully slandered	do.
growsing and brazing	browsing and grazing	do.
Sir, shaid se	Sir, said she	Singing
The miller squake, poth he	The miller spake quoth he	do.
wasked brikly	walked briskly	Reading aloud
greet beens	beet greens	Conversation

unhold torrors	untold horrors	Conversation.
docking starner	stocking darner	do.
merryd whistle tunes	merry whistled tunes	do.
martlett Baddened	Bartlett maddened	Reading aloud.
lave-wength	wave-length	Lecture.
hastened in return	returned in haste	do.
I had to top stown down	I had to stop down town	do.
the stun sill shines	the sun still shines	do.
the facred sire burns	the sacred fire burns	Singing.
stepply stateings.	stately steppings	Reading aloud.
failly wholed	failed wholly	do.
Danto's Inferne	Dante's Inferno	do.
the ort of ar	the art of oratory	do.
dri some buyed beef	buy some dried beef	Conversation.
Bibliosacra Theca	Bibliotheca Sacra	do.
We're quartered in rather close crowders	We're crowded in rather close quarters.	do.
hore bo	bore holes	do.
booh, pah	pooh, bah	do.
quine a fality	fine a quality	do.
chlodium soride	sodium chloride	do.
norishment is stoured up	nourishment is stored up	do.
Why don't you wed you rear one?	Why don't you wear your red one.	do.
Where was his cattle-lard yocated?	Where was his cattle-yard located?	do.

VERBAL EXCHANGES.

the water the wetter	the wetter the water	Conversation.
may not be	may be not	do.
Courage in sword and a heart in hand	Courage in heart and a sword in hand.	Singing.
when he knew of it	when he knew it of	Conversation.
In dark's death	In death's dark vale	Singing.
There goes the hill on the bell	There goes the bell on the hill.	Conversation.
All the cities in the Church	All the Churches in the city.	do.
Perhaps it will settle to to help	Perhaps it will help to settle.	do.
Oh, Is this a mat-lamp?	Oh, Is this a lamp-mat?	do.
be want to put in water	want to be put in water	do.
I took the tables from three glasses	I took the glasses from three tables.	do.
You haven't got all the pool out of that trout	You haven't got all the trout out of that pool.	do.
These opposite marks point	These opposite points mark.	do.
He speaks in her of	He speaks of her in terms.	do.
Is equal Frank to it?	Is Frank equal to it?	do.
to be belong	to belong, to be	do.

golden mouth in his spoon	golden spoon in his mouth.	Conversation.
Matthew on Broadus	Broadus on Matthew.....	do.
Maybe I can leave her with him	Maybe I can leave him with her.	do.
Its apriori time, form	Its apriori form, time.....	do.
The trays in each weight	The weights in each tray...	do.
families from different children	children from different families.	do.
yellowed teeth	teeth yellowed.....	do.
who is by force wakened	who by force is wakened...	do.
so that they were all of them	so that they all of them were.	do.
afterwards it behooves	afterwards behooves it this one.	do.
and make a gift of me to	and make a gift to me of...	do.
in the man of the mind	in the mind of the man....	do.
cellar in the water	water in the cellar	do.
You will use all up	You will use up all my matches.	do.
because they not	not because they occur.....	do.
I'm sorry I've only got the	I'm sorry I've got the only chair.	do.
I thought he said so	I said he thought so.....	do.
Boys never care parasols, neither do they carry for them	Boys never carry parasols, neither do they care for them.	do.
Put your head under his hand	Put your hand under his head.	do.

V. Suggestions for a Psychology of the Ludicrous.

Several theories of the ludicrous have been current in psychological literature. On analysis, each is found to emphasize an important truth necessary to an adequate explanation of the phenomena. In the following analysis are stated the leading factors which must be recognized in any comprehensive theory. The purpose of giving this analysis in the present connection, is not for the statement of a theory, however, but for the cataloguing in a reasonably accurate way of certain comparatively new data of lapses which may be taken into consideration in the development of such a theory. These features which are essential to all experience of the ludicrous are: (1) *Novelty and abruptness*:—wit, repartee, the jest, the appreciation of the new and the wonderful; (2) *Unexpected contrast* (great expectations unfulfilled):—the descent from the sublime to the ridiculous, the pun or play on words, antithetic wit, Irish bulls, unusual analogies, etc.; (3) *Incongruity* (irrelevancy, or

unexpected relevancy):—(*a*) the incongruity of imperfection or incompleteness—*e. g.*, naiveté, crudities, absent-mindednesses, certain forms of lapses, etc., (*b*) the incongruity of deformity or abnormality—*e. g.*, the grotesque (unintentional disproportion), and the burlesque (intentional disproportion), the odd, droll, bizarre, the ludicrous in situation and incident, mannerisms, slang, certain other forms of lapses, etc., (*c*) incongruity of immorality—*e. g.*, the obscene story or joke, suggestive situation or picture, and some lapses; (4) *Agreeableness or pleasure-tone*:—(*a*) on the psychological side, this is the consciousness of superiority; it may be antipathetic (wit), or sympathetic (humor)—as examples of the first, cf. the puzzle, the riddle, conundrum, charade, practical joke, ridicule, caricature, cartoon, satire, sarcasm; as examples of the second, cf. pleasantry of any sort, general geniality, etc.; (*b*) on the physiological side this means summation of sensations with subsequent free irradiation or discharge, which, within certain limits of intensity, is pleasurable.[1]

It is not the purpose here to go into a defense of the above analysis. It is sufficient if it serves the general end for which it is intended. Since the purpose is simply to show the relations of lapses in a psychology of the ludicrous, only those divisions in the analysis will be touched upon which are directly involved. The above outline is given so as to show the point of view from which the subject is approached. Of these divisions the first and most obvious one involved in the case of lapses is what has been called the Deformity Theory of the Ludicrous. Lapses which are ludicrous belong almost wholly within this category. The Deformity Theory in its essence dates back to Aristotle, who connected the effect of comedy with the presentation of meanness or deformity (provided that this did not go so far as to excite painful feelings). It has been further developed by various writers in modern times, notably by Hobbes and Bain. In the case of deformity-lapses which are ludicrous, either the expression is imperfect or incomplete, that is, crude, as when a person begins to say an absurd thing

[1] This is C. L. Herrick's 'Summation-Irradiation' Theory of Pleasure-Pain: cf. *Jour. Compar. Neurology*, March, 1898.

and checks himself; or the expression may be distinctly abnormal or mal-formed in some way; these are, respectively, illustrated by what have been called, above, substitutions and exchanges. Again, the abruptness, unexpectedness and contrast also play their part, though it is not possible, of course, to show cases which illustrate these aspects alone; it is true of most ludicrous lapses. Such cases are very frequent, however, as when a person inadvertently says just the thing which he most wishes to conceal—which, often, as we say, would be ludicrous, if it were not so serious. A slip of the tongue has often plunged a guest or host into momentary despair, only to be followed by an explosion of uncontrollable aughter. Nowhere are such errors felt to be more ridiculous than in the solemn environment of the church or place of religious worship. Table XXXI. is a tabulation of actual errors which caused an outburst of laughter when they were perpetrated. Of course, it is not to be expected that, in this connection, stripped of all the emotional associations which marked their original occurrence, they will all appear ludicrous; but they will serve to show the nature and variety of errors and the forms which they took in eliciting this experience.

The errors in this tabulation are mostly oral, because in the case of graphic errors the mistake is usually detected and inhibited before it attains a sufficiently abnormal form to be ludicrous—a confirmation of the general theory on the physiological side, adopted in the above analysis, that a certain summation or resistance must precede the irradiation or discharge in the (pleasurable) sense of the ludicrous. In the case of oral lapses it is the *sound* of the expression, of course, which is usually the occasion of its ludicrous nature. In the following instance, for example, no one notes the error as especially funny—when a man spoke of a 'wesert daste' instead of a 'desert waste.' But in the case which follows, which is taken from the Joke Column in a newspaper, it is the incongruous meaning which we get from the *sound* of the word which makes us laugh. If we did not hear the mistake, but simply saw it upon the printed page with the exact letters transplaced which were involved in the error, it would not create any merriment.

But when written as it sounds and is first apprehended, we get the ridiculous effect. It is as follows: "A dear old college gentleman had occasion to reprimand an undergraduate who had wasted two consecutive terms in youthful follies. After lecturing the delinquent severely in his queerly high-pitched voice, the dean finished by saying: 'I am sorry to have to speak so severely to you, but I am credibly informed that you have broken many rules of the college; you have been incorrigibly lazy; and, to cap it all, you have deliberately tasted two worms." The newspaper reporters or the originators of the 'quips and quirks' in the Joke Columns of our periodicals, are thus psychologically quite right in spelling the falsely pronounced words and sentences in their incongruous form, as *heard* rather than as seen, since it is just this tendency of the individual to make some sort of meaning out of his errors which is the source of their ludicrous nature. The above mistake would not seem so ludicrous if the exchanged letters were literally transcribed, "tasted two werms." The following examples, which, like the above, may or may not be 'founded on fact,' may be compared with the tabulation of ludicrous lapses. No attempt is made to give the 'setting.' "Occupew my pie" for "Occupy my pew," "Great aches from little toe-corns grow" for "Great oaks from little acorns grow," "From Iceland's Greasy Mountains" for "From Greenland's Icy Mountains," 'Bon the Japtist' for 'John the Baptist,' 'God save the Weasel' and 'Pop Goes the Queen' for 'God save the Queen' and 'Pop Goes the Weasel,' 'A little of that stink puff' for 'A little of that pink stuff,' 'Three miles as the flow cries' for 'Three miles as the crow flies,' 'The froth of Dukeingham' for 'The Duke of Frothingham,' 'Not one tot or jittle' for 'Not one jot or tittle,' 'peedles and nins' for 'needles and pins,' "Twinkle, Twinkle, Little Star, How You wonder what I are," etc., etc.

Various writers have suggested, what may be an application of the Deformity Theory, that there is something distinctly immoral in the ludicrous. This is apparently confirmed by the unrestrainable merriment often caused by some 'slip' in the ordinary civilities of life. Charles Lamb has suggested that a leading element in the enjoyment of certain forms of Comedy

consists in the fact that they free us from the burden of our habitual moral consciousness. Everyone must admit, though he may not be able to explain, the tendency of persons naturally to laugh at what is bad rather than at what is good. In the tabulation (Table XXXI.) will be found cases in which, to a greater or less degree, the more obviously immoral element enters. A few only, and these not the best examples, are given. Many are omitted which might have been cited, simply because they border on indecency or vulgarity, and no useful end could be subserved in their perpetuation. When it is remembered that those which are here appended are ethically and æsthetically the 'cream' of this type of ludicrous lapses it can be understood how real and important, psychologically, is this aspect of the subject. In all these cases there was, on the part of the persons making the errors, a feeling of moral or æsthetic revulsion of greater or less intensity connected with the recognition of the error. They are classifiable in a general way according as they involve the reference irreverently to something sacred, reference to something indecent, or reference to something vulgar (not necessarily falling under the preceding head). Examples of a similar nature from current literature, in which the immoral element is intentionally introduced, are, of course, myriad.

TABLE XXXI.

List of Ludicrous Lapses.

EXAMPLES OF 'DEFORMITY' LAPSES.

Error.	*Correct Form.*	*Remarks.*
in raising bead[1]	In raising bread.....	Conversation.
trickled the ear-drops	trickled the tear-drops.....	do.
as the water runs off a duck back	as the water runs off a duck's back.	do.
various salts and ases	various salts and gases.....	do.
spring ticken	spring chicken, ten cents a pound.	do.
when the formances	when the performances begin.	do.
bother[2]	both taken together.....	do.

[1] Oral ellipsis :
[2] Oral transposition.

snappering	snapping the numerous bonds.	Reading aloud.
down where the apple-ossoms blow[1]	down where the apple-blossoms grow.	Conversation.
It is a thad	It is a sad thing.....	do.
an inch and a high	an inch and a half high....	do.
I swell	I swear I will.....	do.
sourth	source of our faith.....	do.
It is idle to theek	It is idle to seek a third means.	do.
she swooned and swept	she swooned and slept.....	Reading aloud.
juicey	juice milky.....	do.
Mithter	Mister Brithwood.....	do.
the sunshet	the sunset shone.....	do.
I must to Paris, he gashped	I must to Paris, he gasped	do.
Hawaii and Helsewhere	Hawaii and elsewhere.....	Conversation.
ice ouce on the bucket	ice out on the bucket.....	do.
It's very unArthurdox	It's very unorthodox for Arthur to do so.	do.
Profether	Professor Seth.....	do.
I bought three dollars	I bought my dress for three dollars.	do.
My weather	My over-shoes will get all worn out if this weather continues.	do.
cook house	cook meals and keep house	do.
Inspiration may be smelled[2]	Inspiration may be spelled with a small 'i.'	Lecture.
Put down your mouth	Put down your ear to my mouth.	Conversation.
Put my coat in your pocket	Put my cup in your coat-pocket.	do.
Miss Crust	Miss Crew likes the crust..	do.
I'll feel it with my fewt	I'll feel it with my foot in a few minutes.	do.
that thame	that same thing.....	do.
hank	heart sank.....	do.
livers	lakes and rivers.....	Reading aloud.
Quiss	Quick, a kiss.....	Conversation.
kets	pots and kettles.....	do.
such terrible suspenders	such terms as conspectus..	Experimental.
Ours would bump	Ours would break and the pump.	Conversation.
I fool so feelish[3]	I feel so foolish.....	do.
feak and weeble	weak and feeble.....	do.
the ox and the ax	the ox and the ass.....	do.
property pie	proper piety.....	do.
these drumb butes	these dumb brutes.....	do.

[1] Oral substitution.
[2] Oral substitution.
[3] Oral exchange.

She went to the Asho-thecary's pop to get a cint pup	She went to the Apothe-cary's shop to get a pint cup.	Conversation.
I don't feel a good bit	I don't feel a bit good.....	do.
Bass the pasket	Pass the basket	do.
Sheats and Kelley	Keats and Shelley...	do.
She went out on the corch to pool	She went out on the porch to cool.	do.
He snatched up his ind-stank	He snatched up his ink-stand.	do.
the Nalley of the vile	The valley of the Nile.....	do.
a dat with a dosh	a dot with a dash.....	do.
beath-ded scenes	death-bed scenes.....	do.
Let the finishment punt	Let the punishment fit the crime.	do.
fing and thumber	thumb and finger.....	do.
bold coiled ham	cold boiled ham.....	do.
the cocking of the crow	the crowing of the cock....	do.
least my Lordy by[1]	lest my Lord by.....	Composition.
some sick, some sin	dome thick, some thin.....	do.
Five Fooling	Five Foolish Virgins.....	do.
Anothing	Another thing.....	do.
pats	past.....	do.
roost	roots	do.
no dot	do not.....	do.
may bet	may be set.....	do.

EXAMPLES OF 'IMMORALITY' LAPSES.

our gods	our dogs	Conversation.
praying on the street	playing on the street.....	do.
sicked little winner	wicked little sinner.....	do.
Oh Glod	Oh God, It makes us glad.	Prayer.
The purple fluid within the hells	The purple fluid within the cells had.	Reading aloud.
Simon Pether	Simon Peter saith.....	do.
Lord, shôw	Lord, how long shall.....	do.
Jab and Dōvid	Job and David.....	do.
spaul	Paul speaking.....	do.
that thy lays may be dong	that thy days may be long in the land which the Lord thy God giveth thee.	do.
in helebrate	in heaven celebrate.....	do.
and god	and got.....	do.
Has the belly	Has the jelly been passed?	Conversation.
The bulhouse	The schoolhouse is the bulwark of civilization.	do.
stomich	to some extent.....	do.
We've adammed	We've abandoned.....	do.

[1] Graphic errors.

VI. Conclusion.

In summarizing the results of this 'Study,' we must repeat what has been said before, that the conclusions arrived at are corroborative of existing principles, rather than the discovery of new laws. Perhaps the most important and striking illustration of this is the functional rather than *merely* analytic interpretation which the phenomena of lapses require. It is at present impossible to carry this functional treatment into the details of specific cases with any degree of certainty because the method itself, at least when applied in psychology, is still undeveloped. But wherever the functional method can be applied, even in a general way, it always illumines the content analysis. Another such corroborative result is the striking confirmation which the analysis of lapses furnishes, of the bipartite analysis of 'conscious elements.' Search how you will, you never find an error, of the sort here treated, reported in consciousness in any other terms than those of sensation-affection (cognition-feeling).

The examination and comparison of lapses and sense-illusions, moreover, have brought out with great clearness the arbitrary nature of the ordinary distinction between the 'sensory' and 'motor' aspects of the organic circuit. These distinctions, as ordinarily employed, give us no psychological *differentia* at all. The lapse shades over into the sense-illusion, according to the point of view from which it is regarded. But viewed simply as the difference in the prominence of the different phases of the same process, this distinction has a positive value. It is preferable to substitute the term 'kinæsthetic' for the term 'motor' wherever this antithesis is not implied or intended in the use of the latter word.

Attention, it has been seen, must be regarded as the psychical correlate, or rather the psychological statement, of organic adjustment and re-adjustment. Attention goes to, or is developed at or in, the point of difficult adjustment. Ease of adjustment, ready adaptation, mean reduction of consciousness and thus of attention. Conscious experience is a constant disturbance of the tendency toward equilibrium between the automatic and the attentional processes, between habit and ideal. Errors, or lapses,

appear in the re-adjustment in the tension between these two processes. They appear in the breaking up of a habit. Experience is thus better described as a series of errors or mistakes or only approximately perfect adjustments than as a series of 'correspondences.' Just as walking is a series of incipient falls forward, checked at the right juncture for the production of the resultant locomotion, so our normal (ordinary) speech and writing experience is simply a perpetual process of gradual improvement on our past mistakes, a mere refinement of the grosser errors of childhood and infancy by the use of the very flexible and variant symbols which make up our language. There is, perhaps, not a person who could write a page, or make a ten-minute speech, without falling into some form of lapse.[1] Whether the perfect life would mean perfect correspondence with the environment, as certain current theories would seem to imply, or whether such perfect correspondence would not be to remove the very condition of consciousness, it is not for us here to inquire. But certainly the phenomena of lapses suggest rather that the higher development of experience will mean, not frictionless adjustment, but wider range in and greater control of such adjustment.

The similarity between the facts of lapses and of aphasia has been pointed out, mainly to show how our ordinary experience borders on what we call the abnormal or pathological at every point. If the Alienists can make the progress in the interpretation and diagnosis of cerebral disease which their past achievements warrant us in anticipating within the next few decades, there is no reason why the phenomena of lapses should not come in for their share in that interpretation.[2] What the bearing of

[1] Cf. the impossibility of making an absolutely accurate scientific measurement. L. F. Barker (The Nervous System and Its Constituent Neurons, 1899, p. 219), speaking of the 'memory traces' in the neurones of the cerebral cortex, says, "Far from being surprised that the reproduction of past experiences in consciousness is occasionally unfaithful, we can only wonder how it can reach the degree of accuracy with which we are familiar."

[2] For a critique of the theory of neurone retraction, the only theory that has been advanced which attempts to cope with phenomena such as lapses, from the physiological side, cf. a paper by the author entitled 'A Digest and Criticism of the Data upon which is based the Theory of the Amœboid Movements of the Neurone,' *Jour. of Compar. Neurol.*, Vol. X, No. 2.

this may be upon economy in our educational methods, especially instruction in the languages, it would be premature to predict. A further genetic study of lapses is calculated to throw much light upon this side of the subject. But that important results must flow, ultimately, from the study of the relation of the language symbols to the psychogenesis of 'meaning,' no one will question. Especially deserving of experimental, and particularly of genetic study, is the proposition that the psychological unit is ultimately to be stated in terms of the activity-experience; that is, that the psychology of 'meaning' is ultimately reducible to a statement in terms of kinæsthetic sensations.

Attention is called also to the restatement and fresh illustration of the so-called laws of similarity and contiguity, here stated in the form of a single law, that contiguous similars tend to coalesce. It is not presumed that the last word has been said on this subject; but certainly a great many words might have been saved the saying, if these laws had been brought to the test of concrete instances such as are here tabulated.

Lapses, further, are treated under the head of Conflict and Coalescence, as illustrations of the general Herbartian-Stout conception of the competition and synthesis of 'mental systems.' The notion of coalescence, it is seen, must be widened to embrace what have here been called examples of coalescence by modification, as well as coalescence by substitution.

And, finally, it is apparent that among current theories of the ludicrous, the 'Deformity' and the 'Immorality' theories find distinct support in the phenomena of lapses.